THE

# JOURNAL OF GAS LIGHTING.

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## TO CORRESPONDENTS.

W. B. *inquires whether the Mr. George Flintoff, who is advertised as secretary to the Sheffield Consumers' Gas Company, is the George Flintoff late keeper of a second-hand book stall at 153, Fleet-street, London, who figured a few months since at one of the city police courts in connection with some scurrilous doggerel of which he was the publisher and reputed author, entitled "Life of Hangus Scum of Scotia"? Some of our correspondents may perhaps be able to answer the inquiry.*

J. B.—*A landlord can distrain for rent due upon any meter or fittings belonging to a gas company which he may find on his tenant's premises, unless the gas company be specially protected by a clause in their act. Companies without acts of Parliament have no such protection.*

NOTICE TO AMERICAN READERS.

Complete series of the Journal may be had of Messrs. D. Appleton and Co., 200, Broadway, New York, to whom all subscriptions for the United States, after the 10th of January, 1851, must be paid.

## NOTICES.

The subscription is 10s. per annum if paid in advance, or 12s. on credit, payable in two sums of 6s. each, due in June and December of each year. All subscriptions commence from the 10th of January.

All communications and orders for Advertisements to be addressed to the Editor, 32, Bucklersbury, London.

Back numbers exceeding three months' date will in future be charged double price, unless six or more consecutive numbers are taken at the same time. Nos. 6, 15, 18, and 23 are out of print.

The Editor will be particularly obliged by his friends forwarding to him Notices of all Meetings, Trials, or Appeals which it may be interesting to the Gas World to have reported.

## Circular to Gas Companies.

*The Editor may be consulted on all subjects connected with the supply and manufacture of gas, or the alteration and improvement of gas apparatus, and the construction of new works.*

The supply of gas to public lights at less than the cost price, or at one so nearly approaching to the cost as to throw all the other charges of a gas work and interest on the capital invested, upon the shoulders of the private consumer, is a system so utterly inconsistent with the principles of any sound commercial operation as to be repudiated by all parties, except the reckless speculator or professional projector. It is, therefore, with surprise and regret that we find this system again revived in a recent offer of the Equitable Gas Company to light a portion of the public lamps of the parish of St. Marylebone on terms based upon the price of 2s. 6d. per 1000 feet, whilst the lowest rate offered to the private consumer is 4s. per 1000 feet. Every one acquainted with gas lighting in the metropolis is aware of the trap laid a few years ago for some of the district authorities in St. Pancras, and into which they unluckily for themselves fell, as they afterwards discovered to their sorrow, when £6 was demanded for what was originally offered at £3. 10s.; and, though we have no reason to presume that any such trick is contemplated with regard to the Marylebone authorities, yet we cannot too emphatically denounce the revival of a system which, if we may judge from past experience, has been productive of the most ruinous consequences to those who have resorted to it. If reductions can be made, the honest way is to give it to the private consumer till the rates charged to the two classes are more in harmony with each other. Even the Great Central Consumers' Company, in their wildest flights, have kept this principle steadily in view, and, in contracting at £3. 17s. 6d. per 4400 hours for the 5 ft. burner, or about 3s. per 1000 feet, they have, according to their own account, only anticipated by a few years what they believe to be the future normal price of gas in the City of London. On the same principle the Equitable Company must either admit 2s. 6d. per 1000 feet to be the future normal price of gas in St. Marylebone, or speculate on making up the deficiency by screwing the private consumers up to the highest rate they may be strong enough to maintain, and he too weak to resist; or upon increasing the price for the public lamps when the first contract shall have expired. Upon the whole we cannot help regarding this step as one fraught with as much injury to the property invested in metropolitan gas works as Mr. Croll's crusade against the City of London companies. The one brought down the price of gas to private consumers from 5s. to 4s. throughout the great part of the metropolis; the other is the first step towards 2s. 6d. per 1000 feet becoming the standard for public lights; and this on the part of a company whose shares may be purchased at about one half of their original cost, and yield a dividend of only 2½ per cent. per annum, is the more inexplicable.

The unremunerating prices of gas now current in London are commencing to produce the results we have foretold. The British Company has been the first to yield to the pressure, and at its general meeting, held last month, declared a dividend out of its six months' profits of only 3s. 6d. per £18 share, or less than 2 per cent. per annum.

## Communicated Articles.

### THE CHEMISTRY OF GAS LIGHTING.

Before entering into a minute chemical investigation of the different kinds of coal, it becomes necessary to offer a few explanatory remarks concerning the geological history and properties of this important class of mineral productions. Beginning at the surface of the earth, and passing downwards, we find that the formation of coal must have taken place at an extremely remote period, for our principal coal measures belong to what is termed the transition formation—a formation resting on, and derived from, the very earliest or primary formation, but mingled at its upper surface with the remains of vegetable matter, and not wholly destitute of animal indications. To render our line of argument more intelligible to the general reader, we will here introduce a rough tabular view of the order of surface position of the principal formations or groups of rocks, both stratified and unstratified, beginning with the highest, and consequently most recent, deposits.

*Recent Formations.*

Alluvial and diluvial deposits; modern volcanic rocks, such as lava, volcanic ashes, &c.

*Tertiary Formations.*

Upper marine formation, such as the Suffolk crag, Bagshot sand, &c.; alternating marine and fresh water-deposits, London clay, and plastic clay.

*Secondary Formation.*

Chalk, greensand; the oolitic group, consisting of upper,

middle, and lower oolité; lias, new red sandstone, and red marl; magnesian limestone, basalt, &c.

*Transition Formation.*

Coal measures, millstone grit, carboniferous or mountain limestone, old red sandstone, silurian rocks, such as those of Ludlow, Wenlock, and Dudley, greywacke slate, and transition limestone, with amygdaloid, greenstone, syenite, and porphyry.

*Primary Formation.*

Primary sandstone, primary limestone, primary clay slate, mica slate, gneiss, diallage rock, serpentine, and granite.

Of course this tabular view is not intended to represent the mineral structure of the entire globe, or even of any one particular portion of it. In some parts of America several of these formations are altogether wanting, and in our own country remarkable deficiencies occur; as, for example, in Devonshire and Somersetshire, where the new red sandstone of the secondary formation rests immediately upon the greywacke slate, constituting the base of the transition series, the entire coal or carboniferous group being absent. From this table, however, it may be seen that the vegetable productions which have originated the enormous masses of coal now existing in various parts of the earth have been themselves among the very earliest vegetable products of the globe. Growing through the influence of terrestrial heat, and, therefore, in some measure independent of the sun's rays,—surrounded, too, by an extremely humid atmosphere—vegetation appears then to have progressed with a rapidity and to an extent of which at present we can form no adequate conception. Hence, although under existing circumstances it would require at least the whole area of Europe to produce in any reasonable period the vegetable matter capable of furnishing a single seam of the great Newcastle coal-field, yet this in no way militates against the supposition that in the early ages of the world this may have resulted from the vegetation of a comparatively short interval of time. The plants which have produced our deposits of coal also bear witness to the nature of the climate in which they grew; for they belong to extinct species analogous to those now growing in tropical climates only, and have been of the most enormous dimensions and growth. These plants possess the characteristic features of succulent plants, and the remains of some of them are found so clearly defined in the shale surrounding the coal that names have been given to the different species, as, calamites, equisetaceæ, sigillaria, tree-ferns, &c., with which are occasionally discovered fresh-water shells and fishes. From this it would seem that the materials of the primary formation, having become disintegrated through the agency of water, as they are known to be at this day, have thus produced the components of the transition series, in which are to be found all the mechanical and chemical requirements needed for the growth of plants. Vegetation has, therefore, gone on under the most favourable conditions both of soil and climate, and prodigious masses of vegetable matter seem to have been periodically gathered together by floods, and precipitated to the bottom of huge lakes or estuaries, where, covered by secondary deposits, a process of fermentation has taken place under great pressure, with the ultimate production of the various kinds of coal now known, the variations in which have no doubt resulted from differences of age and geological position. Nor is it a little remarkable, as confirmatory of this view, that coal, wherever found, whether in Europe, Asia, America, or Australia, has invariably the same surrounding stratification and position. The same kind of shells, calamites, and other vegetable remains—the same general characters—and, as will be seen, the same description of impurities. Indeed, connected with this latter circumstance is a fact upon which sufficient stress has not been laid by writers on geology. Coal never contains arsenic, nor is the pyritic iron of the coal formation contaminated with this poisonous substance, though, as is well known, ordinary iron pyrites or mundic from the chalk and sand formations constantly yields oxide of arsenic when burnt, as it frequently is for the production of sulphuric acid. But, for this singularly provident arrangement, coal could not have been used, either as a fuel or for the purposes of illumination, without infinite danger to human life. Experiments, however, have shown that plants refuse to absorb arsenic by their roots or spongioles; and, if solutions of this substance be presented either to the leaves or roots of a plant, the process of vegetation ceases at once, and death speedily follows, thus effectually excluding the poison from entering into the organic structure. Sulphur, however, is an invariable element of coal, and sometimes it is present combined with iron as bisulphuret of iron, whilst more rarely it seems united to the other organic constituents of the coal in its simple state, thus proving that the class of vegetables to which we are indebted for coal contained some of those capable of assimilating sulphur, as is now the case with mustard, cress, and other varieties of the natural order Cruciferæ. We have never yet, however, met with any indications of phosphorus in coal, nor are we aware that phosphorus or any of its compounds has been found to exist either in the primary or transition formations. This is a curious subject of inquiry when we reflect that at this stage of the terrestrial development, no animals requiring phosphorus appear as yet to have been formed. One thing, at all events, is certain, that no evidence of the presence of phosphorus, whether in a free or combined state, can be detected in any of the organic productions from the independent coal formation, though the gas from some kinds of cannel coal has an odour which strongly recalls that of phosphuretted hydrogen. Nevertheless, we shall have occasion to show by and by that even when a very large quantity of this cannel coal is burnt not the slightest trace of phosphoric acid can be perceived amongst the condensed products resulting from its combustion. From the chemical analysis of the ashes or cinders left by the different varieties of coal much interesting information may be gathered as to the association of the coals themselves. These analyses will be given with the analytical summary of each coal; and in this way a correct conception of the particular species of coal under examination will be greatly facilitated, as well as the particular epoch to which it belongs. Thus the ash from coals of the independent formation of Werner will demonstrate the inaccuracy of that eminent philosopher's classification, by sometimes presenting us with the elements of felspar, sometimes with those of greywacke slate, and occasionally with those of the old red sandstone formation; whilst in cannel coal at least three distinct species of ashes make their appearance. In practice, there may be said to be three descriptions of coals, viz., anthracite, bituminous coal, and cannel coal; but, from the recent progress of discovery in the generation of illuminating gases, it has become indispensable to take into consideration that wide range of carbonaceous productions in which are placed the different modifications of peat, as lignite, asphalte, and even bituminous shale. Not that these belong to or have any immediate connection with the coal formation, but merely to complete the outline of our investigations, and show that, the compounds now being formed by the decomposition of vegetable matter, neither are assuming nor never will take on the character of coal. Peat may produce lignite, but it is too largely contaminated with earthy impurities to undergo the semiliquefaction requisite for generating a true coal. There is, moreover, given off during the destructive distillation of some coals a certain quantity of muriate or hydrochlorate of ammonia, together, as is asserted, with distinct traces of the hydriodate and hydrobromate of the same alkali. These products clearly refer to plants of the marine kind; and hence it is our intention specially to examine and record those varieties of coal which do, and those which do not, thus indicate a salt-water origin. Several of the common commercial cannel coals are of the latter kind. It might at first be supposed that the muriate of ammonia in question was produced by the decomposition of common salt during the process of distillation, but the quantity of soda salts remaining in the coke is too small to corroborate this opinion; nor is the amount of muriate of ammonia sensibly increased by adding common salt to the coal before it is projected into the retort. This, then, is another point from which we shall endeavour to elucidate the geological history of coal by the investigation of its chemical products. The quantity of water mechanically combined with coal is an important question to those engaged in the manufacture of gas for purposes of illumination; and similar to this is the amount of the constituents of water existing in the coal. Where either much water or its elements are present in coal the gas manufacturer labours under very great disadvantages; for in the first place the illuminating power of the gas then made is seriously impaired, and in the second place a vast increase ensues in the production of carbonic acid, so that the expense of purification becomes outrageously augmented. Our analyses will consequently exhibit the quantity of mechanically-combined water, which a heat of 212 deg. Fahr. expels from each sample, and also the per centage of oxygen which is chemically present in the coal. Some idea of the value of this information may be gathered from the fact that, according to the parliamentary report on steam coals now before us, the quantity of this mechanically-retained water varies even in coals from the same neighbourhood as much as from 1 to 14 per cent., a difference fully equal to 20 per cent. in price, when both coals are employed for gas purposes. As regards the gases capable of being generated from coal, considerable attention will be paid to the effects of heat in their production; thus three temperatures, varying from a dull cherry-red to a whitish red, will be employed, and approximations secured by watching the fusion of metallic alloys having a determined composition. The gases will be examined as to the total per centage of impurity they may contain under each mode of production; and this again will be divided into its constituent gases, sulphuretted hydrogen and carbonic acid—contrasting the former with the sulphur contamination of the volatile products of the coal as deduced from its comparative analysis with that of its coke or residue. The illuminating power of the purified gases will then be ascertained by means of the Bunsen photometer and a spermaceti candle of a given size, in the way so successfully practised by Mr. Alfred King. Having thus briefly detailed the general routine of our operations, little further remains to be stated than that the samples of coal employed will in every instance be selected as fair market specimens, and every avoidable precaution taken to ensure their genuineness. The modes of analysis will, of course, speak for themselves, and are proper objects of critical comment; but, from the rapidly-extending use of gas as a culinary agent, it is intended to devote a portion of our space to the recital of experiments made with the calorimeter, for the purpose of showing the relative heating powers of different gases both in respect to bulk and weight. The

calorimeter to be used is one of a very simple construction, having some resemblance to the worm of a common still deeply immersed in water. Through this worm the heated air arising from the gas in combustion is permitted to travel slowly, so as to become deprived of its surplus heat; and the water surrounding the tube or worm is cooled down exactly as many degrees below the existing temperature of the room in which the experiment is made as it is intended to raise it above that temperature. By this means the compensation needed for radiation is done away with, since it is fair to infer that as much heat will be absorbed at the commencement of the experiment as is given off at the conclusion, especially with a uniform current of gas burning at the jet. In our next we will give a tabulated view of results derived from coals of the Newcastle formation.

*(To be continued.)*

## GAS-LIGHTING IN THE UNITED STATES.

### PHILADELPHIA.

It was not till 1834 that the inhabitants of Philadelphia seriously entertained the project of lighting their beautiful city with gas. In that year Mr. S. V. Merrick was deputed to examine the principal gas works of Great Britain and the continent of Europe; and upon his return in 1835 a company was formed and gas works established, which were put into operation in the succeeding year. The municipal authorities, in granting permission for the laying of the pipes, reserved to themselves the right of taking to the whole concern on paying the shareholders off in a 6 per cent. corporation stock; and in 1841 they availed themselves of this right, since which period the works have been carried on for account of the corporation.

The price of gas at the commencement of the works was fixed at three dollars and fifty cents (14s. 7d. sterling) per thousand cubic feet, and a discount of five per cent. was allowed for prompt payment—the meters and service-pipes being furnished by the works free of cost to the consumer. In September, 1844, the price was reduced by increasing the discount to twelve and a half per cent.; and under the system then introduced it has been successively lowered to three dollars (12s. 6d.) per thousand cubic feet in 1845; to two dollars and eighty cents (11s. 8d.), and two dollars and fifty cents (10s. 5d.), in 1846; and to the present price of two dollars and twenty-five cents (9s. 4½d.), in 1848—with the usual discount of five per cent. for payments within five days from the rendering of the bills.

The report of the engineer upon the operations of 1850 contains so many interesting statistical facts that no apology is needed for presenting the document entire. The reductions into sterling money will be easily made by dividing the dollars by 4·84, the pound sterling being equal to that number of dollars.

### TO THE TRUSTEES OF THE PHILADELPHIA GAS WORKS.

Gentlemen,—The undersigned has the honour to present his Fifteenth Annual Report, exhibiting the operations of the works for the year 1850, and their condition at the close of that year.

The extraordinary increase of demand for gas commencing in the month of November, 1849, immediately after the completion of the large street mains, has been maintained with but little abatement to the present time, the increase for several months being over 40 per cent., and the average increase of the entire year more than 34 per cent. In the summer months the increase upon the corresponding period of the year before fell considerably below the average of the year, in consequence of the general adoption of an arrangement for the closing of stores at an early hour in the evening; but upon the return of the autumnal season of business the demand again rose to its previous high ratio, and pressed so closely upon the means of supply as to require the new sections of apparatus to be put at work as rapidly as they could be completed.

The quantity of gas manufactured during the year is one hundred and eighty-two millions and sixteen thousand cubic feet, making the entire production of the works since their foundation nine hundred and ninety-seven millions eight hundred and fifty-nine thousand feet.

This product has been distributed in the following proportions to the various municipal districts supplied from the works.

To the district of Spring-garden 17,650,600 cubic feet, to Southwark 3,457,800 cubic feet, to Moyamensing 417,900 cubic feet, to the City proper 160,489,700 cubic feet. The latter amount includes the gas used at the works and offices of the trustees, and the loss occasioned by leakage of mains and other apparatus.

The maximum production in twenty-four hours was eight hundred and eighty-seven thousand cubic feet, made on the 22nd of December, and the maximum consumption in the same period was one million and twelve thousand feet on the 23rd of that month. The greatest number of retorts in action is two hundred and sixteen, being within twenty-four of the whole number the buildings contain, and consequently leaving a margin for future increase of only nine per cent.

The materials used for the manufacture of gas are five hundred and ninety-eight thousand two hundred and eighty-four bushels of coals, thirty-two hundred and eighty-two barrels of rosin, five hundred and nine thousand five hundred and thirty-nine bushels of coke, and one hundred and eleven thousand six hundred and sixty-eight bushels of oyster-shell lime.

A summary of the carbonizing account is exhibited in the annexed tabular statement:—

| | | |
|---|---|---|
| Coal in store January 1, 1850 | 332,782 | Bushels. |
| „ received during „ | 511,536 | „ |
| | 844,318 | „ |
| Coal carbonized | 598,284 | Bushels. |
| Swept away by freshet in July | 11,000 | „ |
| In store January 1, 1851 | 235,034 | „ |
| | 844,318 | „ |

| | | |
|---|---|---|
| Rosin in store January 1, 1850 | 2,800 | Barrels. |
| „ received in the year | 986 | „ |
| | 3,786 | „ |
| Rosin distilled in the year | 3,282 | Barrels. |
| „ lost by freshet | 98 | „ |
| „ in store January 1, 1851 | 406 | „ |
| | 3,786 | „ |
| Coke on hand January 1, 1850 | 84,500 | Bushels. |
| „ made in the year | 813,497 | „ |
| | 897,997 | „ |
| Coke used in heating retorts | 509,539 | Bushels. |
| „ „ offices and yard | 8,000 | „ |
| „ lost by freshet | 10,000 | „ |
| „ sold during the year | 285,458 | „ |
| „ on hand January 1, 1851 | 85,000 | „ |
| | 897,997 | „ |

Considerable quantities of these materials were washed away by the great flood that occurred in the Schuylkill river in July last, by which also some damage was done to the most exposed parts of the works on the river front; and gas-making operations were suspended for several hours. The flood of September, although of greater height than its predecessor, occasioned but little damage or loss of property to the works, but again stopped the manufacture of gas by the submergence of much of the apparatus, and moreover cut off the supply to the city by overflowing the outlet of one of the old gasholders, and thus filling a considerable extent of street mains. Such changes have been made in the apparatus submerged by these overflows as is hoped will prevent the recurrence of a suspension of gas-making from any similar event, and it is intended to raise the outlets of the lowest gasholders beyond the reach of all probable floods, as soon as the cessation of the winter demand shall allow them to be thrown out of use.

The reduction of the motive-power charge on bituminous coal coming through from Pittsburg, made by the canal commissioners in the tariff of tolls for 1850, which was announced in the last annual report, has had the effect then anticipated, of bringing into our market a large quantity of this valuable material, and accordingly more than half the year's supply has been derived from that quarter. In consequence of the superior richness in bitumen of this variety of coal, a gas of high illuminating power is obtained from it without the addition of any resinous material, the use of which has been discontinued since the regular introduction of the Pittsburg coal commenced in May last.

In respect to yield of gas, these coals are not quite so profitable as the best varieties obtained from other quarters, nor is the coke quite so lively and free-burning; but, notwithstanding these disadvantages, it will undoubtedly be consistent with good policy to continue the use of them in considerable quantity, so long as a supply can be secured at a moderate price.

To meet the large accession of demand for gas, already alluded to, a corresponding extension of the means of production has been necessary.

The additions to the works comprise a retort-house, 95 feet long by 52 feet wide, containing a double bench of ovens with 60 retorts and their requisite connections; a purifying-house, 47 feet square, in which are 4 purifiers, each 15 feet square; 4 jet-washers, 40 inches in diameter and 15 feet high; a double series of 6-inch condensing-pipes, having an aggregate condensing surface of 1200 square feet; a large station-meter, capable of measuring 20,000 feet of gas per hour; and a gasholder of very large capacity, to be presently described.

These, it will be perceived, constitute a complete suite of apparatus for distilling, washing, purifying, and measuring gas; in brief, a complete gas factory. They are built symmetrical and in connection with the section of works constructed two years ago, and embrace all the improvements then introduced, making them equally effective and convenient. The coal-stores built last year south of High-street have been enlarged by the construction of another section, adding about 35 per cent. to their capacity.

The most remarkable addition to the works is the new telescopic gasholder, 140 feet in diameter, and 70 feet in height, with a capacity of more than a million of cubic feet, constructed upon a novel plan especially adapted to machines of such large dimensions, of which this is believed to be the first example. It has been in constant use from the day it was first filled with gas, and is found to fulfil the most sanguine anticipations of its success in every respect; working as easily and controllably as any other we have in use, and with greater steadiness. An opportunity such as may not soon again offer for testing completely its stability in withstanding high winds was afforded by the great storm of the 23rd of December, which was of such violence as to prostrate several new buildings in different parts of the city, among which was a large brick hotel, nearly completed, in the immediate vicinity of the works.

On this occasion the new gasholder was raised nearly to its utmost height, having in it about a million feet of gas; and, while it was thus elevated, and the gale at its greatest violence, I made a careful examination of it in every part; passing around it at the base and also on the top, and inspecting each guide and column, without being able to detect any tremor of the frame, or the slightest indication of undue strain. It is a source of no little satisfaction that neither human life nor limb was sacrificed in the prosecution of this work, notwithstanding the dangerous nature of many parts of it, especially of the rock excavation in the tank, for which it was necessary to use several tons of gunpowder and many thousand blasting-tubes, in the midst of a force of several hundred labourers engaged in a confined space, and directly alongside one of the principal thoroughfares in the city. The only person seriously injured was a labourer upon whom a loose stone rolled from a bank beneath which he incautiously placed himself; his injuries were severe, but happily not fatal. The masonry of the tank was executed by Mr. Dennis Kennedy; the contractor for the gasholder was Mr. Joseph H. Amer; and for the supporting frame and columns Messrs. Merrick and Son, to all of whom much credit is due for the faithful and skilful execution of the work.

The extent of main-pipes laid in the streets during the year is 25,242 lineal feet, composed of 6666 feet of 2-inch, 9513 feet of 3-inch, 6345 feet of 4-inch, and 2718 feet of 6-inch; making the aggregate length of mains now laid down 500,267 feet, or about 94¾ miles.

The number of meters set and services put in is 1079, the whole number in use being 9238, with about 110,000 feet of service-pipe, or over twenty miles in length.

The registry of new applications amount to 2227; deducting from which

the removals and discontinuances, shows an increase of 1077 customers, using 20,542 lights; there have also been added 85 new street lamps.

The whole number of customers on the books of the office to January 1 is 9216, using 115,004 lights. The number of public lights is 1464 in the streets, 50 in the market-houses, and 62 in the public squares.

The districts of Spring-garden, Southwark, and Moyamensing report 28,056 private and 391 public lights, which, added to those in the city, shows the whole number supplied from the works to be 145,027. More minute details of these several particulars are given in table A.

TABLE A.

PHILADELPHIA CITY REGISTRY.

| DATE. | APPLICATIONS. | REMOVALS. DISCONTINUANCES. | PRIVATE LIGHTS. | | PUBLIC LIGHTS. | | |
|---|---|---|---|---|---|---|---|
| 1850. | | | Added. | Total. | Streets. | Market Houses. | Squares. |
| To Jan. 1.... | 15,714 | 7,575 | .. | 94,462 | 1,392 | 37 | 62 |
| January .... | 150 | 87 | 1,497 | 95,959 | 5 | — | — |
| February .... | 109 | 72 | 1,173 | 97,132 | 1 | — | — |
| March ..... | 149 | 93 | 827 | 97,959 | 3 | — | — |
| April..... | 176 | 100 | 1,422 | 99,381 | .. | 13 | — |
| May ..... | 215 | 102 | 1,525 | 100,906 | — | — | — |
| June..... | 149 | 70 | 1,437 | 102,343 | 8 | — | — |
| July ..... | 128 | 63 | 1,136 | 103,479 | 9 | — | — |
| August..... | 178 | 101 | 1,727 | 105,206 | 4 | — | — |
| September .. | 262 | 139 | 2,343 | 107,549 | 16 | — | — |
| October . .... | 291 | 142 | 2,650 | 110,199 | 2 | — | — |
| November . .. | 249 | 103 | 2,661 | 112,860 | 18 | — | — |
| December . .. | 171 | 78 | 2,144 | 115,004 | 6 | — | — |
| Total..... | 2,227 | 1,150 | 20,542 | .. | 72 | 13 | — |
| Brought down | 15,714 | 7,575 | .. | .. | 1,392 | 37 | 62 |
| Grand total.. | 17,941 | 8,725 | .. | 115,004 | 1,464 | 50 | 62 |

REGISTRY OF THE OUT-DISTRICTS.

| | PRIVATE LIGHTS. | PUBLIC LIGHTS. | MARKET HOUSES. |
|---|---|---|---|
| Spring-garden .... | 25,231 | 288 | — |
| Southwark..... | 2,825 | 82 | 9 |
| Moyamensing .... | .. | 11 | — |
| Totals..... | 28,056 | 381 | 9 |

As it may be considered of some interest to ascertain the cubical content of this extensive line of street main and service pipes, having a length of nearly 115 miles, a computation has been made, from which it appears that their entire capacity is about 75,000 cubic feet, or 550,000 gallons. This quantity of gas was originally passed from the works into the pipes as they were successively brought into use, and was from that time devoted for ever to the purpose of forming the gaseous connection between the works and the consumers.

An erroneous opinion prevails to some extent that the main pipes in the streets are in some sort reservoirs, whose contents may be made available in supplying a deficiency of capacity of the real reservoirs or other source of supply, and, consequently, that increasing the size or number of these mains may, in a measure, compensate for the insufficiency of reservoirs above ground, or of original supply.

If this popular error was one of mere theoretical character it might well be allowed to pass without comment; but as it has a practical bearing from which inconvenience to the community might result, and perhaps, in some instances, has already been experienced, it becomes a public duty to show its fallacy. To do this it is only necessary to consider a few of the circumstances of the case.

When a large inflexible pipe lying horizontally or nearly so, underground, with both its ends closed, is tapped by any number of small tubes rising above the surface of the ground, it is obvious that its contents, whether of gas or water, could not, by their own action, escape upward through the small tubes, unless previously subjected to a pressure greater than that of the external atmosphere; in which case the quantity escaping would be only equal to that produced by the expansion of the confined fluid on removing the surplus pressure, which would be about 1 part in 400 of coal gas for each inch head of water, and about 1 part in 10,000 of water for a head of 80 feet. To obtain anything beyond this it will be necessary either to compress the pipe, or to force out its contents by the introduction of a fresh supply from some external source, which supply must be equal to the quantity abstracted. It follows, therefore, that for every gallon taken from the main a gallon must be allowed to flow into it from the original fountain or reservoir, and that however large the capacity of the main this continues equally true. With insufficient supply from the fountain head, a large main may produce serious inconvenience. To which effect a case in point may be cited from the annals of these gas works.

Early in the year 1848 the demand for gas had reached a magnitude evidently greater than could be supplied by the mains then in use, without some inconvenience to consumers on the lowest parts of the line; as was attested by numerous complaints from the sufferers, and urgent solicitations to have a larger main laid down. The trustees of the works were aware that the quantity of gas then consumed, notwithstanding the inadequacy of the mains, was as great as could be furnished by the works and gasholders at that time existing; and, not entertaining the erroneous opinion in question, they thought it necessary to take the precaution of increasing the source of supply, before adding to the facility of exhausting it by the enlargement of the mains. In this proceeding they were fully justified by the event; for, as soon as the new mains came into use, it was found that the new works and large additional storeroom were barely sufficient to meet the great increase of consumption.

The accounts for labour and materials used in the late extensions have nearly all been rendered and adjusted for final settlement, a few only of minor importance remaining outstanding; the amount of these is known with sufficient precision to show very nearly the cost of all these improvements, which will not materially vary from the original estimates. There has been paid during the year for permanent account 194,028 dols. 6 cents, of which the sum of 58,500 dollars is for liabilities reported as outstanding for the extensions of the previous year. The accounts to which these payments are chargeable are, for works, 117,790 dols. 44 cents; for street mains, 44,565 dols. 73 cents; and for service-pipes and meters, 31,671 dols. 89 cents. The bills remaining unpaid amount to 56,200 dollars. Say for account of works, 39,600 dollars; for street mains, service-pipes, and meters, 16,600 dollars.

The premises appropriated by the city authorities for the use of the gas works were at first supposed to be sufficiently spacious for all their requirements to a very remote period; but so rapid has been their growth that the ground has already been entirely occupied by the structures now erected, and the works, so far as this locality is concerned, may be considered as completed; an event that marks an era in our history, and offers an appropriate occasion for placing upon record a general description of the buildings and apparatus belonging to the establishment; accompanied by drawings exhibiting its principal outlines. A brief account of the state of the works was reported to the trustees on the occasion of the assumption of them by the city in 1841, a comparison of which with their present condition will serve to show the progress made in the interval of ten years.

The plot originally set apart for the works comprised two rectangular blocks bounded by public streets and the river front, and separated by a fifty-feet street into nearly equal parts, each being 306 feet 6 inches by about 270 feet. By the erection of wharfs on the Schuylkill river, the westernmost lot has been extended 170 feet westward to the port warden's line; and a farther addition of space has been acquired on the south by purchase and lease. The latter is separated from the original premises by the High-street bridge and railroad, and is devoted to the stowage of coals, pipes, and other materials; its dimensions are 500 feet by 200 feet. The entire area occupied is about seven acres and a half, with a river front of 800 feet.

The buildings constituting the works have been arranged in two general divisions or groups, distinguished in the books of the establishment as divisions A and B, but conveniently described as the old and new works. Each division is composed of subordinate sections, numbered 1, 2, 3, 4, in the old, and 1 and 2 in the new group.

Every section is a complete and independent gas factory, capable of being worked, unconnected with all the others, as a separate and distinct establishment; but the whole are arranged symmetrically and are susceptible of connection, so that the gas produced in any section may be passed through the purifying apparatus and meter of any other, at will.

The separate buildings comprise two retort-houses, two purifying-houses, two meter-rooms, containing six station-meters and four conical governors, two ranges of workshops, and coke sheds and offices; three coal-stores, two perpetual limekilns, and eleven gasholders of various dimensions.

The old works, embracing all that was built prior to the year 1848, comprises four sections containing 120 retorts, built in two contiguous ranges or retort benches, covered by one roof and connected with one chimney stack. This retort-house is 195 feet in length and 48 feet in width; it is built of brick, and rests upon arches supported by cast-iron girders; giving space for the storage of 50,000 bushels of coals beneath the floor. The height of the chimney is 100 feet; the roof frame is of wrought iron covered with slate. The jet-washers, condensers, and purifiers are contained in a two-story brick building 87 feet long by 35 feet wide, situated on the north of the retort-house, with which it is longitudinally parallel. The jet-washers are eight in number, two attached to each section of thirty retorts; they are in the form of large columns upon square bases, all of cast iron; their dimensions are 40 inches diameter and 15 feet high, each pair being connected consecutively, so that all the gas from the section passes through both. Auxiliary to these are two smaller jet-washers, placed in close proximity to the hydraulic main. The condensers are composed of four separate series of vertical cast-iron pipes, 6 inches in diameter, standing upon boxes of the same material of sufficient capacity to contain the condensed liquids of several days' work. The condensing surface for a section is 600 square feet, disposed in eighteen of the upright pipes connected with nine boxes. The purifiers are arranged in the usual quadruple series, connected by a rotating hydraulic valve. The boxes are 15 feet long by 5 feet wide, containing three tiers of cast-iron baskets or gratings, upon which is placed a layer of quicklime two inches in thickness, giving 675 square feet area of purifying surface for each section, or 2700 feet for the entire range of 120 retorts.

The meters are four in number, having 6-inch outlets, and drums measuring 45 cubic feet to a revolution; the registry extending from ten to ten million cubic feet. Each meter is provided with a telltale and clock, and with water-line and pressure-gauges. These four meters are directly connected by a 10-inch receiving main, with eight gasholders of 50 feet diameter and 35,000 cubic feet capacity, from which the gas passes by two 10-inch outlet mains into two 10-inch governors attached to the street main. Since the construction of the new works, two transverse mains of eight inches diameter have been led off from these meter outlets to those of the new meters, forming the connection between each division and the gasholders of the other.

The range of offices, meter-room, and fitting-shop belonging to this division is 133 feet by 20, the coke-shed 170 by 24, and the coal-shed 80 by 50, arranged round a hollow square.

The new works differ from the old in several respects. They are divided into two sections with 8-inch connections; the purifiers give more surface for the number of retorts, and the general arrangement is more convenient and gives greater security from accidental obstructions.

The retort-house is of the same length as the other, but 4 feet wider, being 195 by 52; externally it corresponds with the other in style of architecture, and is roofed in the same manner; the number of retorts is the same, to wit, 120. The auxiliary washers are much larger, being 24 inches diameter; the principal washers are similar to those in the old house, being eight in number. The condensers are arranged in double series, four pipes standing on one box; the surface for 120 retorts is 2400 feet.

The purifying-boxes are eight in number, 15 feet square, giving 4050 square feet of purifying surface for the two sections. They are supported on brick piers entirely independent of the floor, and elevated so as to allow plenty of light and air to the connecting pipes and drips in the cellar below. The building in which these are placed is 91 feet by 47; it is roofed with slate, as are all the buildings on the premises. There are but two meters to this division, having 8-inch outlets, and drums giving 163 cubic feet to a revolution. Two 10-inch mains connect them with the three largest gasholders, from which two 12-inch mains return to the conical governors in this meter-room.

The gasholders immediately connected with the new division are two of 80 feet diameter, containing 200,000 cubic feet each, and one of 140 feet diameter, with a capacity of one million of cubic feet, all of the telescope form. The old works communicate with these through the two 8-inch

mains before described. The guide frames of these gasholders are entirely of cast iron; those of the 80-feet holders are composed of six stands of fluted columns arranged in pairs, with an entablature to each pair, and raised to three tiers in height, there being thirty-six columns to each gasholder, the whole bound together at the top by cast-iron openwork girders. The large gasholder is guided by twelve sets of columns standing in groups of three raised four tiers high; the lower tier fashioned and proportioned according to the Tuscan order, the second Doric, the third Ionic, and the upper Corinthian; the number of columns being 144 and the whole height of the structure above the coping of the tank 74 feet; the depth of the tank is 36 feet.

The extent of the range of offices, smith-shop, and meter-house of the new division is 122 by 20; the coke-shed, store-rooms, &c., 270 by 22 feet.

The southern coal-store is constructed in four sections 100 feet long by

TABLE B.

| Date. | Services Laid. | Meters Set. | | | | | | | | Public Lamps. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850. | | 3 Light. | 5 Light. | 10 Light. | 20 Light. | 30 Light. | 45 Light. | 60 Light. | 100 Light. | On Posts. | On Wall. | Market Houses. |
| To Jan. 1..... | 8159 | 4258 | 2325 | 1276 | 203 | 51 | 27 | 6 | 13 | 1197 | 195 | 37 |
| January ..... | 64 | 30 | 22 | 10 | 1 | ... | ... | 1 | ... | 4 | 1 | — |
| February ..... | 40 | 15 | 10 | 15 | ... | ... | ... | ... | ... | 1 | — | — |
| March ..... | 60 | 33 | 15 | 10 | 2 | ... | ... | ... | ... | 3 | — | — |
| April..... | 76 | 33 | 23 | 14 | 5 | ... | ... | ... | 1 | ... | ... | 13 |
| May ..... | 104 | 34 | 47 | 20 | 2 | 1 | — | ... | — | — | — | — |
| June..... | 89 | 30 | 48 | 8 | 1 | 1 | 1 | ... | ... | 7 | 1 | — |
| July ..... | 64 | 24 | 26 | 10 | 4 | ... | ... | ... | ... | 7 | 2 | — |
| August..... | 68 | 28 | 24 | 13 | 2 | ... | ... | 1 | ... | 3 | 1 | — |
| September ... | 114 | 37 | 57 | 13 | 6 | 1 | ... | ... | ... | 16 | — | — |
| October..... | 150 | 41 | 70 | 21 | 15 | 3 | ... | ... | ... | 2 | — | — |
| November.... | 129 | 66 | 33 | 21 | 5 | 1 | ... | 1 | 2 | 16 | 2 | — |
| December.... | 121 | 61 | 37 | 10 | 7 | 1 | 2 | ... | ... | 4 | 2 | — |
| Total ..... | 1079 | 435 | 412 | 165 | 50 | 8 | 3 | 3 | 3 | 63 | 9 | 13 |
| Brought down | 8159 | 4258 | 2325 | 1276 | 203 | 51 | 27 | 6 | 13 | 1197 | 195 | 37 |
| Grand total... | 9238 | 4693 | 2737 | 1441 | 253 | 59 | 30 | 9 | 16 | 1260 | 204 | 50 |

TABLE C.

| Date. | Main Pipes Laid in Streets—Lineal Feet. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850. | 1¼ in. | 2 inch. | 3 inch. | 4 inch. | 6 inch. | 8 inch. | 10 inch. | 12 inch. | 16 inch. | 20 in. | Total. |
| To Jan. 1. | 426 | 69,606 | 187,708 | 118,006 | 35,365 | 25,182 | 14,324 | 13,500 | 10,413 | 495 | 475,025 |
| April..... | ... | ... | 1,665 | 801 | ... | ... | ... | ... | ... | ... | 2,446 |
| May..... | ... | 1,506 | 2,268 | 828 | 531 | ... | ... | ... | ... | ... | 5,133 |
| June..... | ... | 1,968 | 135 | 963 | 648 | ... | ... | ... | ... | ... | 3,714 |
| July..... | ... | 1,101 | 234 | ... | 846 | ... | ... | ... | ... | ... | 2,184 |
| August... | ... | 516 | 1,629 | 18 | 171 | ... | ... | ... | ... | ... | 2,334 |
| Sept..... | ... | 156 | 666 | 144 | ... | ... | ... | ... | ... | ... | 966 |
| October . | ... | 522 | 1,674 | 1,728 | ... | ... | ... | ... | ... | ... | 3,924 |
| Nov..... | ... | 894 | 945 | 1,638 | 522 | ... | ... | ... | ... | ... | 3,999 |
| Dec..... | ... | ... | 297 | 225 | ... | ... | ... | ... | ... | ... | 522 |
| Total..... | ... | 6,666 | 9,513 | 6,345 | 2,718 | ... | ... | ... | ... | ... | 25,242 |
| Bt. down | 426 | 69,606 | 187,708 | 118,006 | 35,365 | 25,182 | 14,324 | 13,500 | 10,413 | 495 | 475,025 |
| Gd. total | 426 | 76,272 | 197,221 | 124,351 | 38,083 | 25,182 | 14,324 | 13,500 | 10,413 | 495 | 500,267 * |

* Or 94¾ miles.

TABLE D.

REPAIRS OF SERVICES.

| 1850. | Stopcocks Renewed. | New Covers for Stopcock Boxes. | Services Renewed. | New Stopcock Boxes. |
|---|---|---|---|---|
| January .... | 5 | 8 | 5 | 4 |
| February .... | 7 | 11 | 7 | 9 |
| March ..... | 4 | 7 | 5 | 7 |
| April..... | 13 | 9 | 11 | 15 |
| May ..... | .. | 1 | — | — |
| June..... | 3 | 1 | 2 | 4 |
| July ..... | 5 | 6 | 2 | 6 |
| August..... | 2 | 4 | 1 | 5 |
| September .. | 1 | 1 | .. | 6 |
| October..... | .. | 4 | .. | 2 |
| November .. | 1 | 2 | .. | 1 |
| December.... | 2 | 1 | .. | 5 |
| Total .. | 43 | 55 | 33 | 64 |

TABLE E.

STATEMENT OF GAS PAID FOR IN EACH MONTH OF THE YEAR, being Amount of Bills as per Meters to the First Day of the Month.

| 1850. | Philadelphia City. | | Out Districts. | | | Total. |
|---|---|---|---|---|---|---|
| | Feet of Gas consumed at Private Houses. | Public Lamps. | Spring-garden. | South-wark. | Moya-mensing. | |
| January ... | 14,653,400 | .. | 4,237,500 | 1,192,100 | 75,400 | 20,158,400 |
| February.... | 13,779,200 | .. | .. | .. | .. | 13,779,200 |
| March ..... | 12,285,500 | 9,201,100 | .. | .. | .. | 21,486,600 |
| April..... | 14,531,100 | .. | 4,850,000 | 927,500 | 79,700 | 20,388,300 |
| May ..... | 11,089,000 | .. | .. | .. | .. | 11,089,000 |
| June..... | 10,164,400 | 6,514,650 | .. | .. | .. | 16,679,050 |
| July ..... | 8,973,400 | .. | 3,337,000 | 660,700 | 108,600 | 13,079,700 |
| August..... | 5,635,200 | .. | .. | .. | .. | 5,635,200 |
| September .. | 5,066,700 | 5,259,700 | .. | .. | .. | 10,326,400 |
| October ..... | 7,722,000 | .. | 2,587,000 | 613,800 | 99,100 | 11,021,900 |
| November ... | 9,855 100 | .. | .. | .. | .. | 9,855,400 |
| December.... | 11,507,700 | 7,507,350 | .. | .. | .. | 19,015,050 |
| | 125,263,000 | 28,482,800 | 15,011,500 | 3,391,100 | 362,800 | 172,514,200 |
| Inventory of Stock of Gas delivered and on hand. | | | | | | |
| | | | | Feet. | | |
| January 1, 1851 ..... | | | | 43,251,300 | | |
| January 1, 1850..... | | | | 31,4.8,000 | | |
| | | | | | | 8,753,300 |
| Total in the year ending December 31, 1850..... | | | | | | 181,267,500 |

TABLE F.

ANNUAL REGISTRY OF CONSUMERS AND OF PRIVATE AND PUBLIC LIGHTS.

| Date. | Applications. | Removals, Discontinuances. | Total Number of Consumers. | Private Lights | | Public Lights. | | | |
|---|---|---|---|---|---|---|---|---|---|
| To Dec. 31. | | | | Added. | Total. | Streets. | Market-houses. | Squares. | Total. |
| 1836 | 301 | 24 | 277 | 2,952 | 2,952 | 165 | .. | .. | 165 |
| 1837 | 497 | 108 | 666 | 3,862 | 6,814 | 136 | .. | .. | 301 |
| 1838 | 819 | 174 | 1,311 | 4,288 | 11,102 | 133 | .. | 62 | 496 |
| 1839 | 946 | 300 | 1,957 | 5,380 | 16,482 | 162 | 18 | .. | 676 |
| 1840 | 788 | 382 | 2,393 | 3,317 | 19,799 | 112 | 1 | .. | 789 |
| 1841 | 874 | 493 | 2,774 | 4,387 | 24,186 | 13 | 8 | .. | 810 |
| 1842 | 845 | 541 | 3,078 | 3,054 | 27,240 | 30 | .. | .. | 840 |
| 1843 | 986 | 635 | 3,429 | 3,418 | 30 658 | 59 | .. | .. | 899 |
| 1844 | 1,009 | 503 | 3,936 | 4,910 | 35,598 | 195 | .. | .. | 1,094 |
| 1845 | 1,147 | 629 | 4,444 | 5,754 | 41.352 | 112 | .. | .. | 1,206 |
| 1846 | 1,465 | 717 | 5,192 | 8,138 | 49,490 | 96 | .. | .. | 1,302 |
| 1847 | 1,869 | 887 | 6,174 | 12,987 | 62,472 | 81 | 10 | .. | 1,396 |
| 1848 | 1,956 | 1,002 | 7,128 | 13,935 | 76,412 | 21 | .. | .. | 1,417 |
| 1849 | 2,191 | 1,180 | 8,139 | 18,050 | 94,462 | 74 | .. | .. | 1,491 |
| 1850 | 2,927 | 1,159 | 9,916 | 20,512 | 115,004 | 72 | 13 | .. | 1,576 |
| Total | 17,911 | 8,725 | | 115,004 | | 1464 | 50 | 62 | |

TABLE G.

STATEMENT OF METERS SET EACH YEAR.

| Date. | Services Laid. | Meters Set. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| To Dec. 31. | | 3 Light. | 5 Light. | 10 Light. | 20 Light. | 30 Light. | 45 Light. | 60 Light. | 100 Light. |
| 1836 | 251 | 108 | 98 | 31 | 9 | 2 | 3 | — | — |
| 1837 | 411 | 301 | 77 | 19 | 6 | 2 | 3 | .. | 3 |
| 1838 | 690 | 442 | 159 | 61 | 13 | 9 | 2 | 1 | 3 |
| 1839 | 649 | 421 | 118 | 75 | 26 | 6 | 3 | — | — |
| 1840 | 350 | 198 | 78 | 54 | 13 | 3 | 2 | .. | 2 |
| 1841 | 375 | 203 | 93 | 63 | 14 | 2 | — | — | — |
| 1842 | 299 | 157 | 76 | 57 | 6 | 3 | — | — | — |
| 1843 | 348 | 180 | 110 | 50 | 7 | 1 | — | — | — |
| 1844 | 503 | 293 | 129 | 72 | 5 | 3 | 1 | .. | 1 |
| 1845 | 523 | 311 | 151 | 49 | 7 | 4 | .. | 1 | — |
| 1846 | 761 | 390 | 257 | 113 | 14 | 4 | 2 | 1 | — |
| 1847 | 999 | 481 | 300 | 202 | 12 | 1 | 3 | — | — |
| 1848 | 971 | 408 | 333 | 196 | 25 | 4 | 3 | 1 | 1 |
| 1849 | 1029 | 366 | 366 | 234 | 46 | 7 | 5 | 2 | 3 |
| 1850 | 1079 | 435 | 412 | 165 | 50 | 8 | 3 | 3 | 3 |
| Totals | 9238 | 4693 | 2737 | 1441 | 253 | 59 | 30 | 9 | 16 |

TABLE H.

LENGTH OF MAINS LAID IN STREETS EACH YEAR, IN LINEAL FEET.

| Date. | 1¼ inch. | 2 inch. | 3 inch. | 4 inch. | 6 inch. | 8 inch. | 10 inch. | 12 inch. | 16 inch. | 20 inch. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1836 | ... | 2,310 | 15,551 | 10,184 | 4,018 | ... | 9,140 | ... | ... | ... | 41,603 |
| 1837 | ... | 3,468 | 13,098 | 4,302 | 6,984 | ... | ... | ... | ... | ... | 27,822 |
| 1838 | ... | 150 | 15,660 | 14,409 | 9,036 | ... | 27 | 10,881 | 2,340 | ... | 52,503 |
| 1839 | ... | 1,704 | 11,629 | 11,997 | 4,419 | 3,726 | ... | ... | ... | ... | 33,475 |
| 1840 | ... | 222 | 1,674 | 576 | 261 | ... | ... | ... | ... | ... | 2,733 |
| 1841 | ... | 204 | 8,874 | 7,137 | 27 | ... | ... | ... | ... | ... | 16,242 |
| 1842 | ... | 324 | 6,831 | 3,483 | 360 | 774 | ... | ... | ... | ... | 11,772 |
| 1843 | ... | 966 | 32,796 | 16,767 | 1,395 | 1,053 | ... | ... | ... | ... | 52,977 |
| 1844 | ... | 30,696 | 38,655 | 23,555 | 2,358 | 3,653 | 891 | ... | ... | ... | 99,818 |
| 1845 | 426 | 3,240 | 9,360 | 4,725 | 837 | ... | ... | ... | ... | ... | 18,588 |
| 1846 | ... | 10,731 | 9,855 | 8,442 | 378 | 2,070 | ... | ... | ... | ... | 31,479 |
| 1847 | ... | 4,164 | 6,660 | 2,808 | 900 | 135 | ... | ... | ... | ... | 14,667 |
| 1848 | ... | 1.734 | 7,578 | 3,897 | 1,458 | 477 | ... | ... | ... | ... | 15,144 |
| 1849 | ... | 9,690 | 9,117 | 5,724 | 2,934 | 13,284 | 4,266 | 2,619 | 8,073 | 495 | 56,202 |
| 1850 | ... | 6,666 | 9,513 | 6,345 | 2,718 | ... | ... | ... | ... | ... | 25,242 |
| Total | 426 | 76,272 | 197,221 | 124,351 | 38,083 | 25,182 | 14,324 | 13,500 | 10,413 | 495 | 500,267 |

TABLE I.

STATEMENT OF GAS DELIVERED TO PUBLIC AND PRIVATE LIGHTS TO DEC. 31 IN EACH YEAR.

| Year. | Philadelphia City. | | Out Districts. | | | Used at Offices, Shop, and Works, and Loss by Leakage, &c. | Made at Works. |
|---|---|---|---|---|---|---|---|
| | Public Lights. | Private Lights. | Spring-garden. | South-wark. | Moya-mensing | | |
| 1836 | 978,812 | 4,752,740 | ... | ... | ... | 749,748 | 6,481,300 |
| 1837 | 1,397,687 | 14,454,891 | ... | ... | ... | 1,226,122 | 17,078,700 |
| 1838 | 3,013,546 | 22,356,004 | ... | ... | ... | 1,977,450 | 27,357,000 |
| 1839 | 6,280,654 | 30,658,145 | ... | ... | ... | 2,534,201 | 39,473,000 |
| 1840 | 8,028,818 | 34,874,380 | ... | ... | ... | 2,506,802 | 45,410,000 |
| 1841 | 10,208,180 | 39,648,000 | ... | ... | ... | 1,415,820 | 51,272,000 |
| 1842 | 13,292,000 | 36,596,830 | ... | ... | ... | 922,170 | 50,811,000 |
| 1843 | 12,985,851 | 34,579 900 | ... | ... | ... | 1,324,249 | 48 890,000 |
| 1844 | 13,608,356 | 40,022,800 | ... | ... | ... | 1,152,844 | 54,784,000 |
| 1845 | 17,373,798 | 46.702,800 | ... | ... | ... | 925,402 | 65 003,000 |
| 1846 | 19,164,106 | 55,219 800 | 163,400 | ... | ... | 906,694 | 75,454,000 |
| 1847 | 19,122,293 | 68,071,600 | 2,507,100 | ... | ... | 1,846,007 | 91,547,000 |
| 1848 | 19,924,709 | 78,921,350 | 6,817,000 | ... | ... | 1,109,950 | 106,773,000 |
| 1849 | 24,524,950 | 95,247,100 | 10,713,200 | 2,322,800 | 195,800 | 1,505,150 | 135,509,000 |
| 1850 | 28,482,800 | 131,258,400 | 17,650,600 | 3,457,800 | 417,900 | 748,500 | 182,016,000 |
| | | | | | | | 997,859,000 |

30 feet wide, joined side by side, so that they constitute one building 100 by 120 feet, with the roof supported on five ranges of stone piers 18 feet high: its capacity is about 200,000 bushels.

Between the retort-houses is an undergrcund coal-store, 40 by 190 feet, capable of storing 40,000 bushels.

The limekilns are built of stone in the usual form of perpetual kilns for calcining oyster-shells.

In constructing the more recent buildings, they have been adapted as far as practicable to the use of labour-saving machinery for the storage of coals, and for the conveyance of these and other heavy materials to the various points where they may be wanted. The railways and machinery for these purposes it is designed to construct in the course of the current year, and an important reduction of the labour and expense required for these operations is expected to result from the improvement.

The progressive growth of the establishment in its various departments is exhibited in several condensed statements arranged in tabular form. The usual monthly details of new customers, and increase of lights and mains, and of sales of gas, are given in tables A to E inclusive. Those marked from F to I exhibit the aggregates of these items for every year since the establishment of the works. (See preceding page.)

In concluding this descriptive account of the works, a few remarks upon some of the causes to which their uninterrupted prosperity and rapid growth are in a measure atributable may not be out of place. At the commencement of the enterprise it was determined that the construction of the works and the system of management should be such as might lead to the greatest attainable security against the dangers and annoyances then generally supposed to be necessarily attendant on the use of gas-lights, the most frequent origin of which was either in defectiveness in the apparatus and pipes, imperfect purification of the gas, or irregularities of quality and supply. A system of regulations was adopted at an early period, prescribing with great exactitude the materials, sizes, manner of connecting, and degree of tightness of all pipes and other fittings, and strictly prohibiting any unauthorized interference with or disturbance of such fittings.

The most efficient and unfailing means of separating from the gas its known impurities are required to be carefully applied, according to the indications of delicate chemical tests. A high standard of illuminating quality has been adopted and vigilantly maintained either by the use of the proper varieties of coals, or by the addition of a proportion of gas from resin, when the coals had fallen below the proper standard. The quality aimed at is that found in gas having, when purified, a specific gravity one-half that of atmospheric air, the economical value of which is such as is designated twenty-candle gas; that is to say, the light of an argand burner consuming four feet an hour is equal to that of twenty sperm candles six to a pound. The desired result as to quality has been attained without the aid of resin, by the use of certain varieties of coals from Western Pennsylvania, or of a proper mixture of cannel with Newcastle and other coals.

The success with which these measures have been carried into effect is forcibly demonstrated by the entire freedom of our streets and houses from the peculiar odour of gas, by the remarkable diminution of the loss from leakage usually experienced, amounting in some works to 20 and 30 per cent. of the quantity made, but falling as low as 2 per cent. in ours; and, finally, the general introduction of gas lighting, not only in stores and places of public resort, but also in the parlours and sleeping apartments of dwellings of every class.

An important topic claiming attention at this time is the prospective demand for gas, upon which must be based our estimates for enlargements of manufacturing capacity required during the ensuing season.

Some degree of embarrassment has always been experienced in the endeavour to arrive at a definite and satisfactory determination of a question involving contingencies that cannot be foreseen, nor subjected to any known rule of calculation.

For several years there has appeared to be good reason for the supposition that the ratio of increase was near its eventual maximum, and must thenceforward decline until it should reach a moderate average, which might be maintained for a number of years without any important variation. But these expectations have been annually exceeded by the result, and the year just closed has surpassed all that have preceded it, not only in the actual amount of the increase, but also in its ratio or per centage above the previous year. Part of this great increase is undoubtedly attributable to the additional head of supply afforded by the large mains completed in the autumn of 1849; but the continuance of a high ratio of increase in the months of November and December, when the comparison was no longer affected by this circumstance, is an indication which it may not be entirely safe to overlook in our estimate for the incoming year.

The district of Spring-garden is engaged in the construction of works from which their own supply will be obtained as soon as they are put in operation, which is expected to take place in a few months, and the city works will consequently be relieved to the extent of the consumption of that district, amounting to 9 per cent. of the whole production. If we adopt as the supposed increase in the city and districts the ratio maintained in November and December and the first ten days of January inst., and deduct therefrom the proportion furnished to Spring-garden, there will remain an increase of 16 per cent. to be provided for in the present year.

For one-half of this increase the works now existing may safely be relied upon, and, if the increase could with certainty be limited to a maximum of 16 per cent., it might be practicable to push them for a brief period to that extent.

But as the certainty of this limitation is by no means demonstrable, and the continuance of the increase subsequently to the present year is to be anticipated and provided for, the reasons for immediate action for a farther increase of the works would appear to be of greater cogency than any that can be adduced for an opposite course.

The point first to be considered after the erection of new works shall have been determined on is the selection of a suitable location. The reasons for preferring a site beyond the densely-populated portions of the city having been already communicated to the trustees, it is unnecessary to reiterate them in this place, but it may suffice to add that farther reflection has strengthened my opinion of the propriety of adopting this course.

The cost of constructing the new works and connecting them with those now in use cannot be estimated with much precision until the locality is decided upon; but the chief items of expenditure, aside from the general preparation of the ground and the laying down of the connecting main, need not, and probably will not, vary materially from those incurred in the recent enlargements.

For the purchase of sufficient land for the probable ultimate extent of the works, and preparing it for that purpose, and for the erection of suitable buildings for a complete section of apparatus, laying a large independent main connecting with the old works, with a regulating gasholder at the new site suitable for the supposed requirements for the next three or four years, the sum of 300,000 dollars will, in my judgment, be required. The whole of this amount need not be at once expended; but the scale of magnitude on which the new establishment can be laid out, and the completeness of its general arrangement, must be conformable to the amount of expenditure for which authority is granted by previous action of councils, and in order to the most economical and beneficial application of the funds it is requisite that the initial arrangements should be commensurate with the magnitude of the works at maturity.

Very respectfully,

JOHN C. CRESSON, Engineer.

*Philadelphia Gas Works, January* 10, 1851.

## ASSETS AND LIABILITIES ON JANUARY 1, 1851.

| *Assets.* | Dols. | *Liabilities.* | Dols. |
|---|---|---|---|
| Works | 475,269 46 | Loans 1, 2, 3, 4, 5, 6, and 7 | 967,000 00 |
| Street mains | 401,139 55 | Dividends unpaid | 405 00 |
| Service-pipes and meters | 184,891 87 | Interest on gas loans, including that due January 1, 1851 | 21,007 20 |
| Public lamps | 11,814 02 | For coals, repairs, and materials used in the manufacture of gas | 30,111 16 |
| Cash | 42,531 30 | Sinking fund | 364,795 45 |
| Suspended debt | 1,896 34 | Contingent fund derived from profits | 249,785 28 |
| Stocks belonging to the sinking fund at cost | 364,764 50 | Profit and loss (amount of suspended debt) | 1,896 34 |
| Coal on hand, 235,034 bushels, at 24 cents | 56,408 16 | | |
| Coke on hand, 85,000 bushels, at 3 cents | 2,550 00 | | |
| Rosin on hand, 406 barrels, at 1 dol. | 406 00 | | |
| Due for gas sold and delivered and on hand | 81,758 73 | | |
| Due for coke, tar, &c. | 3,500 00 | | |
| Interest on city loans, due January 1, 1851 | 2,070 50 | | |
| Wharf lot on the Schuylkill | 6,000 00 | | |
| | 1,635,000 43 | | 1,635,000 43 |

## PROFIT AND LOSS ACCOUNT FOR THE YEAR 1850.

| *Dr.* | | *Cr.* | |
|---|---|---|---|
| *January* 1, 1850. | Dols. | *January* 1, 1850. | Dols. |
| Amount due for coals, materials, and repairs, chargeable to the manufacture of gas | 51,089 58 | Amount of stock on hand and debts due to the works at this time | 142,856 00 |
| *December* 31, 1850. | | *December* 31, 1850. | |
| Sales of gas in 1850 | 333,182 95 | Payments during the year, and other charges against the manufacture of gas:— | |
| „ of coke „ | 12,870 71 | Coal and other materials and wages | 176,964 10 |
| „ of tar „ | 3,742 19 | Repairs | 25,303 06 |
| „ of lime „ | 1,961 66 | Incidental charges | 31,839 69 |
| „ of stone „ | 112 03 | Salaries | 6,154 16 |
| „ of old materials and sundries | 999 36 | Interest on mortgage on wharf lot | 77 17 |
| Rent of wharf | 289 44 | Premium on sales of loan, appropriated to the sinking fund, as directed by ordinance | 3,892 34 |
| Rent of office and cellar | 140 00 | Appropriated to the sinking fund, as directed by ordinance | 25,098 33 |
| Premium on sales of loans | 3,892 34 | Interest on loans for the year 1850 | 52,523 50 |
| Interest to the time when the loans were sold | 2,495 16 | Amount due January 1, 1851, for coal, repairs, and materials used in the manufacture of gas | 30,111 16 |
| Stock on hand January 1, 1851:— | | Suspended debt, January 1, 1850 | 1,862 50 |
| Coal | 56,408 16 | Stolen from the office by burglars | 369 54 |
| Coke | 2,550 00 | Balance | 57,244 07 |
| Rosin | 406 00 | | 557,294 62 |
| Gas delivered | 81,758 73 | | |
| Due for coke, lime, tar, &c. | 3,500 00 | The above balance of | 57,244 07 |
| Suspended debt | 1,896 34 | Less the sum of | 33 84 |
| | 557,291 62 | The increase of the suspended debt, during the year, gives the net increase of the contingent fund for 1850 | 57,210 23 |

1850.—DETAILS OF MANUFACTURER'S ACCOUNTS.

PAYMENTS FOR CURRENT EXPENSES.

| | Dols. | |
|---|---|---|
| *Gas.* | | |
| Wages of stokers, &c., employed in retort houses and purifying houses, manufacturing gas and wheeling coals | 37 414 | 32 |
| Coals | 124,839 | 20 |
| Freights on coals | 3,036 | 21 |
| Measuring and carting coals | 5,155 | 00 |
| Rosin | 2,320 | 75 |
| Lime and shells | 3,921 | 72 |
| Duties | 276 | 90 |
| Total | 176,951 | 10 |
| *Repairs.* | | |
| Wages of carpenters, blacksmiths, fitters, and labourers engaged in repairs of works, street mains, and services | 7,120 | 31 |
| Castings | 7,049 | 69 |
| Fire-bricks and clay retorts | 3,973 | 23 |
| Meters | 2,531 | 33 |
| Iron | 1,014 | 19 |
| Bricks | 849 | 37 |
| Hardware | 835 | 74 |
| Tinwork | 377 | 18 |
| Wharf | 374 | 00 |
| Limekiln | 332 | 13 |
| Pumps | 189 | 25 |
| Paints, glass, and oil | 186 | 07 |
| Gas fixtures and plumbing | 122 | 92 |
| Sand | 94 | 55 |
| Wirework | 38 | 92 |
| Iron turnings | 34 | 19 |
| Leatherwork | 27 | 78 |
| Paving | 29 | 26 |
| Lumber | 25 | 58 |
| Trunk boards | 21 | 79 |
| Tallow and muslin | 20 | 40 |
| Roman cement | 12 | 00 |
| Repairing meter clock | 12 | 00 |
| Grindstones | 11 | 25 |
| Carting | 5 | 25 |
| Cleaning scales | 1 | 25 |
| Total | 25,303 | 06 |
| *Incidentals.* | | |
| Wages of men employed in the inspection of fittings and meters, taking statements for bills, in care of public lamps, storing coals and coke at works, clerk hire at works, measuring coke and lime, and all other incidental matters not appertaining to other specified heads | 22,074 | 69 |
| Rents | 5,413 | 50 |
| Taxes and water | 1,671 | 60 |
| Alcohol and muriate of lime | 1,517 | 41 |
| Heating apparatus | 656 | 00 |
| Carting | 262 | 26 |
| Stationery | 521 | 20 |
| Matting | 207 | 76 |
| Exchange on Liverpool | 247 | 22 |
| Subscription and advertising in newspapers | 133 | 00 |
| Barrels for tar | 135 | 09 |
| Horse keep | 128 | 46 |
| Submarine dress | 125 | 00 |
| Trimming and planting trees | 42 | 62 |
| Brooms and baskets | 78 | 07 |
| Paints and oil | 54 | 94 |
| Reports of lighting | 48 | 00 |
| Gas fittings | 39 | 78 |
| Freights | 36 | 85 |
| Stove | 21 | 85 |
| Hardware | 10 | 58 |
| Pliers | 15 | 12 |
| Turning | 5 | 09 |
| Miscellaneous expenses of offices, postages, &c. | 1,385 | 78 |
| Total | 34,839 | 69 |

# Correspondence.

## ON THE ANALYSIS OF COAL GAS.

SIR,—In the last number of the JOURNAL OF GAS LIGHTING appears a letter from Mr. Lewis Thompson, professedly on the analysis of coal gas, but really containing nothing but an attack on Dr Frankland and myself, for I have in vain sought in it for any information on the analysis of gaseous mixtures, the reason whereof may become apparent as we proceed.

Mr. Thompson considers it eminently desirable that, "in writing on matters of science for the instruction of gas engineers, the greatest care should be taken not only that the instructions are rigorously correct and capable of easy comprehension by professed chemists, but, moreover, that they are brought within the ordinary educational scope of those for whose especial benefit they are intended." In all this I perfectly agree with Mr. Thompson; but there is another matter which I deem of equal importnace, and equally desirable with this, and which appears altogether to have escaped Mr. Thompson's attention, and it is this, that, when he undertakes to criticise such attempts, he should himself know something of the subject on which he proposes to write. But Mr. Thompson would be facetious and far-seeing too, and has a shrewd suspicion that there may be a professional connection between Dr. Frankland's report, my letter, and a certain advertisement on the face of your journal. Ay, here is the head and front of our offending; this it is that has excited all his ire. What! shall it be said that coal or cannel or the gas from these shall be sent down to Manchester for analysis, whilst Mr. Lewis Thompson is ready to do it in London? I fear I shall have to tear the veil from Mr. Thompson's sagacity as well as his chemistry. I will not undertake to say that my letter was written with any view to instruct gas engineers how to analyze coal gas; very generally, I believe, they have neither the time nor the necessary preliminary chemical knowledge for it. My object was merely to lay before them the various methods which have been hitherto proposed, with such additions as a considerable practice in gaseous analysis had led me to think desirable, well knowing that such as possessed some chemical knowledge would be able to judge of the relative accuracy of these methods, even if not sufficiently familiarized with chemical operations to conduct them themselves. It happened that I was professionally engaged a few years ago to analyze the gas from Wigan cannel, and immediately before I wrote my letter my attention was called to a statement by Dr. Fyfe (whose mild and gentlemanlike letters must win him every chemists' regard, and for whom I beg to express my highest respect) on the composition of this gas in a former number, by one of the gentlemen for whom I made the examination. As my results were more favourable to the cannel than Dr. Fyfe's, I thought it an act of justice to publish these results; but, as such a publication would have been worthless without a detail of the method employed, I also published that method wtth an analysis of others that have been proposed. Such is the brief history of the connection between my letter and the advertisement. As regards Dr. Frankland's report, you are yourself aware, sir, that it was not sent to you by him at all. Dr. Frankland was employed by the Resin Gas Company to make experiments and analyses for them. When his investigations were concluded he drew up a report of them. This was printed by the company, and a copy, I believe, sent to you by themselves. But, even had it been otherwise, there had been nothing very wonderful in the matter. Dr. Frankland has been many years engaged in gaseous analysis, and chemists who have read his beautiful researches on the isolation of the organic radicals, with the accompanying analysis, will not have their opinion of his competency much affected by Mr. Thompson's criticism. For myself, I may say, that I have been continually engaged in the analysis of coal gas for the last ten years, and, as the doctor and myself thought we possessed some considerable facilities for the examination of coal gas, in the way of apparatus and experience, we saw no great harm or impropriety in undertaking to conduct such examinations for whoever might think fit to demand our services. I fear we must plead guilty to the soft impeachment. Well, if all this be sinful, God help the wicked! Why! what is Mr. Thompson's letter but an advertisement? I will now proceed to examine the statements of Mr. Thompson on the methods employed, though I fear that, as these methods are avowedly incomprehensible to him, I can scarcely accord him the title he has so comfortably assumed of a "thorough practical chemist." Indeed, after reading his letter, it is impossible to believe that he has ever analyzed a sample of coal gas in his life.

Mr. Thompson finds great fault with Dr. Frankland because he has not stated the quantity of aqueous vapour in the gases he examined. It is not always usual to do this, nor is it of the slightest importance; for it is always understood, when this amount is not expressed, that the gas had been dried previous to the analysis, and that the statements of composition refer to the dry gas. I, it appears, have been more explicit, though at the expense of my credit for accuracy, because, forsooth, Mr. Thompson assumes, what is not the fact, that every sample of coal gas is fully saturated with moisture before it is analysed. I collect the gas in a dry tube, and very seldom find it fully saturated. Then, again, he is in a state of great perplexity respecting the saturation of a porous coke ball by dry sulphuric acid, and conceives that it would be as easo to saturate a brickbat with tenpenny nails. Dry sulphuric acid happens to be perfectly liquid at 77 deg.; and when a ball of coke is heated to redness in a gas or spirit lamp flame to expel the air from it, and then plunged into dry sulphuric acid, it requires no great stretch of imagination to understand that the acid would enter such a porous material. Iron fuses at 2786 deg.; and I confess to having great doubts that, if a piece of red-hot coke, or even a red-hot brickbat, were plunged amongst cold masses of it, either of them would become saturated with the iron, though, as Mr. Thompson has specified the price and form of the iron, the latter might have something to do with the process. However, after a very short time the acid in the bottle remains permanently liquid at the ordinary atmospheric temperature, doubtless from absorbing a minute quantity of moisture. The most absurd objection he makes to the use of sulphuric acid is that it precipitates every kind of volatile hydro-carbon as well as olefiant gas. Why, so it does, and so does chlorine; and if they did not they would be perfectly valueless in the examination of coal gas. He hints at my misgivings on this matter, for that I have termed the matters condensible by sulphuric acid olefiant gas and illuminating hydrocarbons. God wot! I never had any misgivings all; they are all Mr. Thompson's; for I have distinctly stated that the chief illuminating power of coal gas is due to the presence, not of olefiant gas alone, but of this and other higher carburets of hydrogen; and I have shown in the analysis that it could not be olefiant gas alone, for eight volumes and a half of this gas would require for combustion only twenty-five volumes of oxygen, whilst the same volume of matters in the coal gas condensible by sulphuric acid required forty-thre volumes of oxygen for combustion.

In my first experiments by this method, which were on gas from a different cannel to what was employed for the gas of the analylis quoted, I obtained four volumes and a half of oxygen as the quantity required for the combustion of one volume of the gases condensible by sulphuric acid, and believed then that the gas was a compound of three volumes carbon vapour and three volumes of

hydrogen condensed into one volume, a gas that has been recently called propylene. Dr. Dalton and Dr. Henry had long before come to the same conclusion in their examination of coal gas. Subsequently, when examining richer cannels, I found that the condensible gases combined with more than this quantity of oxygen, and, as olefiant gas certainly exists in the condensible portion, it was necessary to assume some still higher carburet than propylene, such as $C^9 F^8$ (Faraday's gas. It is probable that no higher carburet than this of the formula Cn Hn exists in it, as the tendency to liquefaction would be too great. However, the fact that the quantity of carbonic acid produced on full combustion is greater than would result from the explosion of any carburet of the form Cn Hn is conclusive as to the existence of different carbo-hydrogens than these, and as benzole, whose existence in coal tar I proved in 1840, is contained in the lightest naphtha, there can be no doubt that a portion of this, and probably of Mansfield's allyle, also exist in the gas Still, whatever the relative proportions of these, the method of analysis detailed in Dr. Faraday's and my papers, gives their value as illuminating materials. Nothing of all this does he understand, says Mr. Thompson; and, after reading his letter, I can very well understand that the effect of olefiant gas, and of carbo-hydrogens of form Cn Hn, in preventing the action of oxygen on phosphorus, as very fully established by Graham, he has confounded with the almost or absolute non-effect of light carburetted hydrogen, and says that, "In his hands phosphorus has *entirely* failed to remove oxygen from coal gas." I can do nothing here but express entire incredulity, for had Mr. Thompson ever tried the experiment of removing oxygen by phosphorus, after the action of sulphuric acid on coal gas, even in "his hands," it must, to a large extent, have succeeded. Had he passed a ball of moistened phosphorus into the gas, volumes of white vapours would have poured down from the phosphorus, amply visible, even to his eyes. Although, to a very great extent, efficient in the entire removal of the oxygen, it is not, I believe, absolutely so, when the quantity of oxygen is considerable; but in coal gas it is usually exceedingly small in amount. Liebig's method of extracting the oxygen by pyrogallic aid, is, I believe, better; indeed, it appears to be perfectly exact. Mr. Thompson "knows, of course, that this acid, dissolved in a strong solution of caustic potash, has *a limited power* of this kind," and talks of its "questionable efficacy." Let us see what the illustrious Liebig believes and thinks he knows on the same subject. "If," says he, "we introduce into a glass lute, closed at the upper end, graduated in equal divisions, and filled with dry, expired air, the lower open end being immersed in mercury, about $\frac{1}{100}$th the volume of the air of strong solution of caustic potass, the volume of the air instantly diminishes, the carbonic acid present being absorbed by the potass. If, now, we add to the potass a concentrated solution of pyrogallic acid, about half the volume of the potass, *the mixture absorbs the oxygen as rapidly as red-hot copper does. The volume again diminishes to a degree exactly corresponding with the amount of oxygen present.*" For Liebig's analysis see "Annales des Chemie," Baud 77, pp. 107—114.

In my paper I stated that any moisture left in the gas after the employment of moistened peroxide of manganese might be removed by caustic potass, and that the oxygen might then be removed by phosphorus or pyrogallic acid, a process corresponding to Liebig's, the small quantity of potass liquid left in the tube being enough to form sufficient pyrogallate to remove the oxygen. Liebig's analyses with pyrogallic acid are quite conclusive as to its value in absorbing oxygen.

In the explosion of the gas with oxygen I have advised that a large excess of the latter gas should be used, in order to prevent the formation of nitric acid; and, if this be done, no nitric acid will be formed. "But," says Mr. Thompson, with wonderful self-sufficiency, "Mr. Leigh should have said, "I explode a quantity of the gas with the least possible excess of oxygen, so as to diminish the risk of forming nitric acid during the explosion." I should have said no such thing, Mr. Thompson, for this is the very way to ensure the formation of nitric acid; and it is scarcely creditable to a "thorough practical chemist" to be ignorant of this, and to suggest such a form of expression. It is evident that this would be Mr. Thompson's way. The production of nitric acid under these circumstances was first observed by Cavendish, and traced by him with consummate ability to its source. When gaseous analysis began to be more generally practised in this country, the attention of chemists was called to this source of error by Kolbe, who showed that it depended on the high temperature produced in the explosion, and might be entirely avoided by diluting the gas with atmospheric air or adding a large excess of oxygen. Mr. Thompson next finds fault with the enumeration of the precautions necessary in conducting an analysis of gaseous mixtures; but this is mere cavilling, and unworthy of a serious reply. Any man accustomed to gaseous analysis is thoroughly aware of the absolute necessity of such precautions if the examination is to be of any value, and he merely furnishes an additional proof that he is totally ignorant of the processes of gaseous analysis.

There is but one other objection of Mr. Thompson to which it will be necessary to advert, and that is, the alleged inconsistency of the results of the analyses with the specific gravity of the gases. "Tested in this way," says he, "all the analyses are wrong," both Dr. Frankland's and mine; from which, with the illustrations he has given, it simply appears that he does not know how to calculate the specific gravity of a gaseous mixture at all. In Dr. Frankland's analyses the specific gravities were not tried experimentally at all, but all of them calculated from the results of the analyses; and if any competent person will go through them, he will find that Dr. Frankland's specific gravities are right, and Mr. Thompson's all wrong. I am afraid Mr. Thompson's authority—Cocker—if he were yet in existence, would be ashamed of his pupil. In calculating the specific gravity of the London gas from my analysis, although distinctly told that the 3·83 per cent. removed by sulphuric acid was not olefiant gas alone, but a mixture of this with heavier hydro-carbons, yet he calculates the specific gravity as if it were olefiant gas only, the 1·13 grains being the weight of 3·83 cubic inches of the latter gas only. So much for his accuracy. Such a statement can only be regarded as a most wilful perversion of the truth, or a result of gross ignorance. What the real specific gravity was I had not sufficient to try experimentally, having merely a small quantity in a hermetically-sealed tube, but quite sufficient for analysis, and I did not think it worth while to calculate it from the analytical results.

I have now run over his objections, and I think the reason has become tolerably apparent why, with these objections, he has given no information on gaseous analyses, suggested no improvements on our processes. Neither Dr. Frankland nor myself has a shadow of doubt of the accuracy of the analyses published, nor the excellence of the processes adopted. They are the processes united of Bunsen, Kolbe, Regnault, Liebig, and some of the most distinguished analysts of the present day; and we believe that we have made an advance on them by determining the amount of hydrogen and carbon contained in the gases condensible by sulphuric acid, which, although it does not inform us in what form they are combined, nor how many carbo-hydrogens are associated, yet gives us, in the amount of oxygen consumed, and of carbonic acid produced; their value for the purposes of illumination, and our confidence in them will not be shaken till we meet with a very different critic to Mr. Lewis Thompson.

*Manchester, Oct. 6*, 1851. JOHN LEIGH.

## Register of New Patents.

HERBERT MINTON, of Hart's-hill, in the county of Stafford, gentleman, and AUGUSTUS JOHN HOFFSTAEDT, of Bridge-street, Blackfriars, in the city of London, gentleman, for "*improvements in the manufacture of faces or dials for clocks, watches, barometers, gasmeters, and mariners' compasses, or other articles requiring such faces or dials.*" Patent dated March 17, 1851.

The improvements patented consist of the substitution of faces or dials made of clay or other plastic materials for those of wood, metal, or enamel, at present used. These faces or dials are made by the process employed in the manufacture of china, &c., and they may either be moulded from the clay or the clay may be thrown at the wheel, and the objects formed turned at the lathe in the usual way and then dried and fired.

Instead of the above process, the dials or faces may be formed from dry clay or other suitable material by powerful pressure, the process patented by Mr. Prosser in 1840 being applicable to this purpose. The graduations, figures, or devices required in the faces or dials may be applied to them whilst in the state of biscuit-ware, and afterwards glazed and burnt in the manner usually adopted in the manufacture of china, &c.; or the surface may be first glazed, and afterwards placed in the enamelling oven. The mode of application may be varied: it may be either by transfer from paper to the biscuit-ware, as in the ordinary printing of earthenware, or by direct printing. The surface-printing process patented by Collins and Reynolds in 1848 may also be used for this purpose, as well as that patented by Samuel Wright in 1830, and employed by Minton and Co. in the ornamentation of the encaustic tiles manufactured by them. In this latter process, indentations, according to the required pattern, are made in the soft clay, and filled up with "slip" of any required colour; the whole surface being afterwards glazed or not as may be preferred.

The patentees claim:—

The manufacture of faces and dials for clocks, watches, &c., and other articles requiring such faces or dials, from plastic clay, or other analogous material, or from dry clay, or other analogous material, as above mentioned; also the application of the process employed in the ornamentation of encaustic tiles, producing the graduations, figures, and devices on the surface of such faces or dials.

## Miscellaneous News.

### THE GAS MOVEMENT IN ST. MARYLEBONE.

A movement has recently sprung up in the parish of Marylebone, in reference to the gas question, in the shape of a "St. Marylebone Gas Consumers' Company;" but it must be understood that the movement has not originated with the gas consumers of Marylebone themselves. Scarcely one local name appears in the prospectus issued by the company, the only representative of which, who ever make their appearance in public, being Mr. John Marriner, the secretary; Mr. Holman, the solicitor; and a publican named Smith, who informed our reporter "that the Marylebone Gas Consumers' Company was *his* concern." In order that the gas consumers of Marylebone and the public may judge as to the prospects of a new gas company confining

itself within the precincts of a parish like Marylebone, it may be as well to state the exact position in which that district stands with regard to gas lighting. There are four companies at present with their mains laid down in various portions of the parish of Marylebone, viz., the Chartered Company, lighting the south-eastern district; the Equitable, lighting nearly the whole of Oxford-street; the London, lighting Regent-street, passing through Portland-place, and lighting the whole of the Regent's-park; and the Imperial, which lights nearly the whole of the public lamps, and the great bulk of the parish. In addition to this there is the Western Gas Company, with its works at Kensal-green, and its mains closely abutting upon, and which they can bring into, the parish of Marylebone at any moment after compliance with certain regulations laid down by the vestry, the other old companies having the same privilege at any time. Every one at all acquainted with the parish of Marylebone must be aware that, after passing the New-road on the north side, the gas lighting is very inconsiderable, whilst the roads in the vicinity of St. John's-wood, and extending in a northerly direction to Kilburn and Hampstead, are, so far as gas lighting is concerned, a mere waste, the Imperial Company having nothing but the public lights, for which the parish pay £3. 11s. per annum per lamp of four-hole burners, and which the authorities of the Imperial Company contend burn, each lamp, 17,500 cubic feet of gas per annum, and costs them an actual outlay for painting, keeping in repair, cleaning, &c., £1 per annum, thus reducing the actual receipts per lamp to £2. 11s. per annum for the gas supplied, being about 3s. 4d. per 1000 feet, or 33 per cent. less than the price paid for public lights in Manchester, where the gas works are the property of the corporation. This, then, is the actual state of things with regard to the gas question in Marylebone, with the addition that to private consumers the Imperial Company are now charging for their gas 5s. per 1000 cubic feet.

The "Marylebone Gas Consumers' Company" have recently commenced an agitation on the subject by calling district meetings of the gas consumers and ratepayers of the various districts for the purpose of affording an explanation of the objects and intentions of such company, and its claims for support on the parishioners; and on the 10th ult. a meeting was held at the British Stores Tavern, New-street, Portland-town, when Mr. Marriner and Mr. Holman attended, as at the previous meeting, to explain the objects and prospects of the proposed company.

Mr. MARRINER opened the proceedings by reading the prospectus, offering to supply gas at 4s. per 1000 cubic feet.

Mr. PEARSE called upon Mr. Holman to produce Mr. George Frederick Argles, the promoter of the company, who, he restated, was the clerk of Mr. Holman, the solicitor to the company.

Mr. HOLMAN stated that it was false to say that Mr. Argles was his clerk.

A long personal altercation then took place between Mr. Pearse, Mr. Holman, and Mr. Marriner. After the noise had in a measure subsided,

Mr. M'DOWELL made a speech in favour of the company, and moved a vote of confidence in its promoters, which was seconded by Mr. King.

Mr. BURGESS then presented himself to ask a question or two of Mr. Marriner and Mr. Holman. He said that he was a pretty considerable gas consumer in Marylebone, and was therefore interested. Some months ago an agent of this new company called on him to put his name down in a large book, but, having once been bitten in his life, he refused to do so. ("Hear, hear," and interruption.) He thought it necessary to make inquiries, and he found that this new "Marylebone Gas Consumers' Company," as they called themselves, came in there under false colours. (Cries of "Hear, hear," and uproar from the supporters of the new company. He (Mr. Burgess) knew nothing of the promoters, only that they were not ratepayers of that parish, and that there was one gentleman mixed up with it of the name of Princep. (Cries of "He has left it.") But the question which he (Mr. Burgess) wished to put to those gentlemen was as to the liability of shareholders. (Loud cries of "Hear," and uproar.)

Mr. HOLMAN (solicitor to the new company): The liability of the shareholders is to the amount of their shares, and no more.

Mr. BURGESS: How can you say that in the face of the act of Parliament, the Joint Stock Companies' Act? ("Hear," and confusion.)

Mr. HOLMAN: An opinion has been given by the three first men at the bar that if, as in the 97th clause of the Great Central Gas Consumers' Act, and inserted in the deed of settlement, such provision is made, it is binding.

Mr. BURGESS: I see that you have circulated the opinion of counsel on a case prepared by the promoters of the Great Central Gas Consumers' Company, to the effect that the liability is limited to the amount of the shares. Now, I have here the Joint Stock Companies' Act, 7th and 8th Vic., cap. 110, sec. 66, which I will read. ("Hear, hear," and "Oh, oh.")

Mr. HOLMAN: Lend me the act and I will read it. ("Oh, oh," and laughter.)

Mr. BURGESS: No, I can read it myself.

Mr. Burgess then proceeded to read—

Mr. HOLMAN (interrupting): You ask me a certain question, and you are not reading what I require you to read.

Mr. PEARSE: We know you don't like it. (Cries of "Oh, oh," and confusion.)

Mr. BURGESS persisted in reading the 66th section, to the effect "That any judgment obtained against the company may be enforced, not only against the property and effects of the company, but also, if due diligence shall have been used to obtain satisfaction of such judgment by execution against the property and effects of the company, then against the person, property, and effects of any shareholders for the time being, or any former shareholders, of such company, in his natural or individual capacity, until such judgment be fully satisfied." Now, he would ask the gentlemen to inform the meeting how the opinion of counsel was to overrule and set aside the law of the land? (Hear.) Were the Great Central Company satisfied themselves with such opinion, or was it not true that after receiving it they applied to Parliament, at an expense of many thousand pounds, to get an act to limit the liability of shareholders to the amount of their shares? (Loud cries of "Hear, hear," and confusion.)

Mr. MARRINER: We have no intention of applying for an act of Parliament; it is not necessary.

Mr. BURGESS. How is it, then, that the Great Central Company felt it necessary? ("Hear," and "Oh.")

Mr. HOLMAN: That is a long tale. (Roars of laughter and confusion.)

Mr. BURGESS said: It was a question, however, that the gas consumers of Marylebone ought to be made acquainted with before they entered into partnership with this or any other company. He had known many people ruined by such partnerships, and he confessed that he should not like to take shares after the feeble explanation which had been offered. ("Hear," hisses, and groans.)

Mr. HOLMAN read extracts from a printed paper which had been circulated, containing the opinions of Mr. M. D. Hill, Mr. Edwin James, and Mr. Lush, to the effect that if there was a proviso in the deed of settlement it was sufficient to protect shareholders from responsibility beyond the amount of their shares. As to the Great Central Company applying for an act of Parliament, the fact was notorious that the Court of Sewers compelled them to have an act at the instigation of a certain gentleman who was interested for the old companies—(loud cries of "Name"); and when they did so the same individual turned round and said, "Now I will oppose you right and left in Parliament." (Renewed cries of "Name, name," from Mr. Pearse and others, and great uproar.) He declined to name, as it would be invidious. ("Oh, oh," and uproar.) £25,000, however, was spent through this gentleman in litigation. (Renewed cries of "Name," and uproar.)

Mr. PEARSE: I say we ought to have the name. (Confusion.)

Mr. MARRINER: Do you mean to say, Mr. Pearse, you don't know the fact?

Mr. PEARSE: I do not. ("Oh, oh," and hisses.)

Mr. MARRINER (vehemently): Mr. Pearse knows the fact! Mr. Pearse, you profess to be a man of truth, and yet you say you do not know the fact! ("No," from Mr. Pearse.) I shall place a pamphlet before you to-morrow which will inform you of the facts.

Mr. PEARSE: You ought to have come provided with it.

Another altercation took place between Mr. Marriner and Mr. Pearse, which led to much confusion.

Mr. SHIELD rose to order, and complained that Mr. Marriner had taken great liberty with one individual. A name had been asked for, and he did not see what objection there could be to giving it. He did not think a gentleman should stand up in a public assembly and call another, equally respectable, a liar. (Cries of "Serve him right!" and "No, no; it is false!") Such conduct should not be tolerated.

Here a scene of indescribable confusion arose, several persons speaking together, and denouncing one another in language not very select.

Mr. MARRINER challenged Mr. Pearse to meet him anywhere in public.

Mr. PEARSE offered to meet Mr. Marriner at the Literary Institution. ("Bravo, Pearse!")

Mr. MARRINER: On the last occasion when I challenged you to speak the truth, you shuffled out of it in a way that an honourable man would be ashamed of. ("Hear, hear," and "No, no.")

Mr. PEARSE: You shuffled at the London and Westminster Bank last April. You shuffled there, and took yourself off. ("Oh, oh.")

Mr. VANHEEMS (a late vestryman of Marylebone) said: Mr. Marriner had stated that they had £20,000 a year income in promises, and the hardship had been complained of in making gas consumers pay in advance. He wished to know what security the new company intended to give their shareholders that they should have their share of the profits. It was usually the practice of tradesmen to ascertain beforehand whether a party was capable of paying for his goods supplied or not. If to do so with respect to gas was a hardship, what was the security for shareholders against a dishonest consumer?

Mr. MARRINER said it simply resolved itself into a commercial question. If you think proper to trust a man, and he does not pay you, it is not right that another person should be mulcted for the debts of his predecessor. (Loud cries of "That is not answering the question.") With proper men about them, and proper supervision, care would be taken that they were only supplying such parties as would pay. The secretary has the proper supervision of your business, and ought only to supply those who you are sure will pay. (Cries of "Oh, oh!" and confusion.)

At this stage of the proceedings the indignant and violent tone of the meeting was changed into one of the greatest merriment, consequent on a Mr. Phelps jumping on the table, and declaring that he moved a vote of thanks to "Mister John Marriner, Esq." After the laughter had somewhat subsided,

Mr. SHIELD said most men were satisfied with one handle to their name, but the gentleman who moved this had given Mr. Marriner two. (Renewed laughter and uproar.)

Mr. EDWARD SMITH: If that gentleman is not as well educated as Mr. Pearse, or the other great gasometer beside him, he is more to be pitied than laughed at.

Mr. SHIELD: Well, I move, then, that the gentleman be pitied. (Roars of laughter, groans, and cries of "Turn him out!")

Mr. PEARSE: And I move that "Mister Edward Smith, Esq., publican, of the Tyrawley Arms, High-street, be also pitied." (Renewed uproar, and cries of "Turn him out!" on which a rush was made at Mr. Pearse, who exclaimed, "Here is a ruffian placing his hands on me!" and he retreated towards the chairman, on whom he called for protection.)

Mr. CONCANEN (amidst cries of "Why don't you go and get

shaved?" in allusion to a tremendous moustache and beard which he wore, "Are you a ratepayer?" &c.,) seconded the motion.

Mr. PEARSE: He is no ratepayer of Marylebone. He lives at 427, Oxford-street, in the parish of St. Ann, Soho. (Uproar.)

Mr. CONCANEN, as a gas consumer, wished for cheap gas; and, therefore, seconded the resolution.

Mr. SHIELD said his fellow-ratepayers, if they passed that resolution, would be thanking a man for nothing, or rather for coming there to benefit himself. (Hisses and uproar.) He should move as an amendment that no thanks were due to Mr. Marriner at all. (Tremendous uproar, and cries of "How much have you been paid to turn round?") He expected about £300. (Laughter, and "I wish you may get it.") The promoters of this new gas company were nothing better than a set of adventurers and speculators—(tremendous uproar)—and if his fellow-ratepayers supported them they would speedily find out their mistake.

After a protracted altercation the motion was carried, and this very noisy meeting broke up.

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Another meeting similar to the preceding took place at the Yorkshire Stingo, New-road, on Wednesday evening, the 17th ult. The meeting was convened by a placard signed "James Wilkins," on the part of the requisitionists, and was exceedingly well attended, about three or four hundred persons being present, amongst whom we noticed Messrs. Poland, M'Evily, Clement George, Simmonds, Beacon, Row, Thomas D'Iffanger, jun., J. R. Bagshaw, Dr. Joseph, and other late and present vestrymen of Marylebone. Mr. Marriner, the secretary, and Mr. Holman, of Bedford-row, the solicitor to the proposed new company, were present, as was also Mr. William Pearse, the well-known champion of the existing gas companies.

Mr. GLOVER, of George-street, Bryanstone-square was at eight o'clock called to the chair. He said he was not a gas consumer, nor was he in any way connected either with the old or new company. (Hear, hear.) He hoped there would be no dictation on either side—(Hear, hear),—but that the meeting would give all parties a fair and impartial hearing. (Hear, hear.) He would first call on Mr. Marriner, the secretary of the new company, to address the meeting.

Mr. MARRINER repeated the statements made by him at the previous meetings.

Mr. WILKINS (the requisitionist) rose to move a resolution. He said: The great object of this meeting is to get cheap gas. (Hear, hear.) I am not a gas consumer now, but I *were*. (Laughter.) I burnt gas in Great James-street, but they cut it off. (Cries of "What for?") We have brought gas down from 12s. per thousand to 5s., and we mean to have it at 4s. That is the next thing. Coals *is* cheaper, bread *is* cheaper, and we have a right to go to the cheapest market. ("Hear, hear," and laughter.) Mr. Wilkins moved a resolution to the effect—"That this meeting, having heard with satisfaction the explanations given by the solicitor and secretary of the Marylebone Gas Consumers' Company, are of opinion that the directors are entitled to the warmest support of the parishioners of St. Marylebone, and that every effort should be made on the part of this meeting to support them, with the view of establishing a cheaper and better supply of gas to the inhabitants of the parish." (Cheers.)

The CHAIRMAN: We have not heard anything yet from the solicitor of the company: we have only heard the statement of the secretary. (Laughter.)

The word "solicitor" having been erased,

Mr. M'DOWALL, in seconding the motion, dwelt on the importance of having cheap gas, denounced monopoly, and objected to acts of Parliament for the special benefit and protection of existing companies. Gas should be dealt with on the same principles as bread, butter, and other articles. ("Hear, hear," and loud cries of "Coffee," and "No chicory," in allusion to Mr. M'Dowall's business.) The men who were now making immense fortunes out of gas allowed the inventor to die in a London workhouse. (No, no.) Well, if the originator did not die there, he was at all events a long time within the walls of a workhouse. ("No, no," and "Hear, hear.")

Mr. PEARSE rose to reply, to contradict this assertion; and having been called to order by a gentleman in the neighbourhood of the chair, some very strong language, as well as cards, was interchanged in consequence. In various other parts of the room the cause of disorder was promoted with similar success, but nothing worse than hard words ensued. Mr. Pearse at length resumed his seat.

Mr. Pearse and Mr. Shield then rose together, and each claimed precedence in addressing the chair.

The CHAIRMAN declared in favour of Mr. Pearse.

Mr. SMITH objected to hear him on the ground that he was not a ratepayer.

Mr. SHIELD said he had only a simple question to put to Mr. Marriner.

Mr. MARRINER expressed himself ready to answer any question that might be put, and hoped the meeting would hear Mr. Shield.

After some further delay,

Mr. SHIELD said Mr. M'Dowall told him at the British Stores, Portland-street, on Tuesday last, that he had purchased two shares, and paid 5s. deposit on them; but did not Mr. Marriner state that he had received no money since the company was formed?

Mr. MARRINER: I have only to repeat what I stated before, that we have never received one shilling, although money has been tendered, not only on the part of individuals, but on the part of their friends. We have refused universally to take one shilling until the position of the company was placed beyond a doubt. (Cheers.)

Mr. PEARSE, who had been on his legs for a considerable time, and manifesting the strongest desire to be heard, was now informed that he might address the meeting. He said: Gentlemen, I appear before you to-night; I have taken no notes of the rambling speech of Mr. M'Dowall; but allow me to commence my observations with a statement he made, which is important as to the character of the old-established companies.

A Voice: Are you a ratepayer?

Mr. PEARSE: Yes.

A Voice: Where do you reside?

Mr. PEARSE: My name is William Pearse ("Who gave you that name?" and laughter), and it is well known where I reside. One of the most prominent untruths which he (Mr. Pearse) felt called on to contradict was the statement made that the respected inventor of gas-lighting and founder of the parent gas company (the Chartered), which had lighted the south-eastern district of Marylebone for forty five years, had died in a workhouse. ("Hear, hear," and cries of "Question," "Cheap gas, cheap gas," &c. &c.) That gentleman was Mr. Winsor. So far from having died in a workhouse, he died in France, where he lived ten years before his death. The Chartered Company allowed him £200 per year till his death, and the same pension to his widow for eleven years after it, and his son was now one of the directors of the Chartered Company. So much, therefore, for the statement of Mr. M'Dowall and the ingratitude of the old gas companies to the originator of gaslighting. (Cries of "Question," and great uproar.) It was said that this new gas company would pay 10 per cent; such a statement was perfectly ridiculous. (Confusion.) Why, the Chartered Gas Company only paid 6 per cent. and no bonus—(laughter)—he told them that upon his honour. (Renewed laughter and uproar.) Their £50 shares could be obtained for £44 in the market. The average per centage paid by all the gas companies did not exceed 4 per cent., and the Equitable only paid 2½ per cent.

Here an attempt was made to push Mr. Pearse off the platform, and the greatest confusion prevailed for some time.

Mr. PEARSE: It is "Mister Edward Smith, Esq., of the Tyrawley Arms," who is interrupting me; but I am determined to be heard. (Cheers and confusion.) It has been said the Imperial Company charge in this parish too high for the public lights. ("Hear, hear!" and cries of "So they do!") My name is William Pearse, and I deny it. (Uproar.) I say that the parish of Marylebone have, with the Imperial Company, one of the most advantageous gas contracts in England. (Cheers, "Oh, oh!" laughter, and uproar.) I say so, and I challenge Messrs. Easton and Amos, the engineers of the new company, to prove the contrary. I challenge Mr. George Frederick Argles to prove the contrary. (Uproar.) Why are they not here? ("We don't want them.") But I do, and I will never rest satisfied till we have them before the gas consumers of Marylebone. (Cheers and great confusion.) I challenge them to meet me at the Literary Institution to go into the question, and I will prove that you, the people of Marylebone, have at this moment good and cheap gas. (Laughter, "Hear, hear!" and "No, no!") I repeat it; you have both. (Renewed uproar, and cries of "Turn him out!") I will test it and prove it; and I repeat my challenge, and will put down £50 to meet Messrs. Easton and Amos, and prove it—that you, the inhabitants of Marylebone, have good and cheap gas already.

A VOICE: We must have it cheaper still. (Cheers and confusion.)

Mr. PEARSE: I say this in defiance of all Messrs. Holman, Marriner, and Co. can say to the contrary, that you not only have good and cheap gas, and plenty of it, but that the Imperial Company not only light your highways and byways, but even your hedges and ditches. (Cheers and confusion.) There are about 3400 public lights in this parish, and you have four gas companies already in the parish—the Chartered, the London, the Imperial, and the Equitable—and, therefore, I contend that the consumers of Marylebone do not want this fallacious humbug company. (Tremendous uproar.)

Mr. STAINES: Retract the word "humbug." (Loud cries of "Retract, retract!")

Mr. PEARSE: You're not a humbug. (Laughter and continued uproar.) I did not say any individual was a humbug; I said humbug company—(cries of "Retract, retract!" and great confusion)—and I will ask what has become of its original directors? How many have retired? (Cries of "Question!") Is Lord Loftus now a director? (Great uproar.) I say again, I'll put down fifty guineas to meet them all at the Literary Institution in Edward-street, and pledge myself to kick over the whole of their statistics. (Cheers and uproar.) I am a member of the Great Central Gas Consumers' Company—(loud cries of "No, no!" and "Yes, yes!")—and I here pronounce it one of the greatest frauds ever perpetrated. (Uproar.) It was founded by deception, and maintained by deception and falsehood. (Great confusion for several minutes.)

Mr. MARRINER here interrupted Mr. Pearse, and a personal altercation ensued, the purport of which did not reach the reporters on account of the uproar which prevailed.

Mr. PEARSE: The Great Central Company, like this new Marylebone Gas Consumers' Company, talked about paying 10 per cent., and what is the value of their shares in the market? (Uproar and cries of "Question!") [Mr. Pearse here flourished a large sheet of paper, which turned out to be *Crossley's Share List*, dated Sept. 6, from which he read, and said the price of shares of the Great Central Gas Consumers' Company was quoted at nil. (Great uproar.)] I tell these gentlemen speculators, and I tell the gas consumers of Marylebone, if they expect to obtain 10 per cent. they will never get it in this world. (Uproar.) [Mr. Pearse here produced another large sheet of paper, from which he proceeded to read; it turned out to be in reference to a charge made against him at a previous meeting of publishing a letter from a gentleman named Eales, repudiating his name as a director, after receiving a second letter, stating the respectability of Mr. Holman, the solicitor to the company. He found he did not publish his letter until Mr. Marriner had published his second.]

Mr. MARRINER (jumping up with great warmth): I deny the fact. (Uproar.)

Mr. PEARSE: Well, we are at issue on the point; but I adhere to my statement. (Loud cries of "Question!" and uproar, particularly from the platform.)

Mr. STAINES: I insist upon taking the opinion of the meeting as to whether this man (Mr. Pearse) shall be longer heard. (Cries of

"Shame, shame!" "Hear, hear!" "Turn him out!" and uproar.)

Mr. PEARSE: What are you?

Mr. STAINES: I am a brewer.

Mr. PEARSE: Then I will give you a friendly call.

After prolonged interruption and confusion,

The CHAIRMAN put it to the meeting whether they would hear Mr. Pearse out or not? (Loud cries of "No, no!" and "Yes, yes!")

A Voice: He shan't be heard!

Mr. PEARSE: You shall hear me! (Tremendous cheering and uproar.)

The CHAIRMAN: Those who are in favour of Mr. Pearse being heard out hold up their hands. (About two-thirds of the meeting held up their hands in favour of hearing him, and the remainder against.)

The CHAIRMAN: The show of hands is in favour of Mr. Pearse being heard. (Cheers and great uproar on the platform, Mr. Pearse waving his papers over his head in triumph, and thanking the meeting, at which moment a not very creditable attempt was made to capsize him into the body of the meeting.)

Mr. FRAMPTON: I protest against the chairman's decision, and I tell Mr. Pearse he shan't be heard! (Tremendous uproar.)

Mr. PEARSE (who conversed with Mr. Marriner during the row): I am bound in justice to Mr. Marriner to say he wishes me to be heard—(cheers)—but it is "Mister Edward Smith, Esquire"—(laughter)—and other esquires of the same order, who are making interruptions, and say I shall not be heard. (Cries of "Turn them out!")

Mr. BEACON rose to order: They had nothing to do with personal squabbles between Mr. Marriner and Mr. Pearse. (Hear.)

Mr. PEARSE: I am in possession of the chair, and you, as a member of the vestry, ought to know better than to interrupt me. ("Hear," and continued confusion.) I protest against it.

The CHAIRMAN said Mr. Pearse was out of order in relating to any private matters. (Hear.)

Mr. PEARSE contended that he was quite in order in showing the character of the proposed new company. (Here another tremendous row took place on the platform, and a further attempt was made to upset Mr. Pearse, but he seized hold of the table, and had the attempt been successful the chairman and others must have followed. The uproar continued for several minutes.)

Mr. CHEESELEY said in such an excited state it was impossible to do any business, and he moved the adjournment of the meeting.

Mr. SHIELD seconded this amendment, and on being put it was declared to be lost.

Another row took place on the platform, and the Chairman, who held in his hand a large auctioneer's hammer, was seen to make a blow at Mr. Frampton, who appeared to feel discretion the better part of valour by making a precipitate retreat towards the back. Shortly afterwards Mr. Wilkins reappeared on the platform, having disengaged himself from a row in another part of the room, and his crushed hat bore ludicrous testimony to the severity of the bonneting which he had received. His appearance excited the moist boisterous merriment.

Mr. PEARSE: Here is one of the gentlemanly esquires calling the chairman a "humbug." (Roars of laughter, cries of "Turn him out!" and continued uproar.)

The CHAIRMAN: Yes. The Emperor of China (in allusion to Mr. Frampton's trade as a chinaman) has called your Chairman a humbug. (Cries of "Shame!" and confusion.) I think we have had enough of gas, and I shall put the resolution.

Mr. SHIELD: I have another amendment to propose (jumping on a table).

The Chairman paid no attention to Mr. Shield, but put the resolution, which he declared to be carried, although from the confusion which prevailed no one appeared to know what was the question, and it was impossible to say, therefore, how the matter was disposed of in reality.

Mr. SHIELD protested against the decision of the Chairman, whom he charged with acting very partially. He persisted in handing up his amendment, which we afterwards ascertained to be the following, but it was not read at the meeting:—"That this meeting pledges itself to buy gas of the Marylebone Gas Consumers' Company when they have the article to sell, and recommend them to call a public meeting at their earliest convenience after erecting their works and laying down their mains."

The Chairman quitted the chair, and Mr. Pearse, amidst loud cheers from his friends, mounted the table, and again repeated his challenge to Mr. Marriner. Mr. Marriner stood by his side, and declared he accepted it, amidst the cheers of his friends, and the meeting broke up in great uproar.

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A fourth meeting of ratepayers and gas consumers of the All Souls' and Trinity district of the parish of St. Marylebone was held on Friday evening, the 26th ult., at the Portland Rooms, 32, Foley-street, Portland-road, for the same purpose as the preceding ones, the disorder, interruption, and confusion that characterized the proceedings throwing completely into the shade the uproarious displays made at the three previous meetings.

Mr. SANDARS, who presided, briefly explained the objects of the meeting, and entreated a fair and impartial hearing for all parties. He then read a letter from Mr. Pearse, stating that he was absent in consequence of important business, but that he would endeavour to be with them before the meeting closed, as he would not lose the chance of facing Messrs. Marriner, Holman, and Co., and asking some questions respecting G. F. Argles. The reading of this communication excited considerable merriment, followed by loud cries of "Oh, oh!"

Mr. SHIELD: I believe that is an expression of regret that Mr. Pearse is not here. ("No, no," and "Yes.")

Mr. MARRINER, having read a statement of the objects of the company, concluded by expressing his readiness to answer any question.

Mr. HEWLETT said the matter upon which they were called together was a very important one. The question was, whether they should have cheaper and better gas than at present. He believed they all wanted cheap gas, and they did not care much how they got it. Much was said of the brilliant quality of the gas which the new company promised to supply them with; but it appeared to him that the gas then burning in the room was very good. (Hear, hear.) [The gas was certainly of great brilliancy.] If he saw tradesmen or influential parishioners coming forward and placing their names on the direction, he would have confidence in the new company, and might take a share or two; or if he saw a few vestrymen doing so. ("Oh!" and groans for the vestry.) He had no connection with the vestry. (Question.) Well, then, he would ask Mr. Marriner a question. Why did not Mr. Marriner open his shop like every other tradesman who had an article to sell? ("Hear, hear," and cheers.) But first of all he solicited them to be customers, and then he would open a shop somewhere. He did not only do that, but he asked them to bind themselves to be customers for three years, and this, too, after stating that he came into the parish to relieve us from the monopoly of the old companies. Why, he wishes to establish a monopoly of his own of the most oppressive character. We can discontinue the use of the old companies' gas whenever we like, but Mr. Marriner wishes us to bind ourselves to take the gas for three years whether we like it or not, and this, too, in the face of a fact which we all know, that the old companies have reduced the price of their gas during the last three years 2s. per thousand feet, without the assistance of Mr. Marriner and Mr. Holman, and have gradually reduced it from 15s. to 5s. per 1000 feet since they have been lighting the parish. I wonder if Mr. Marriner and his friends would have done this if they had had their monopoly-contracts? The new company also fixed the price permanently at 4s. (Uproar.) Would the new company offer to supply half the parish, and at what price?

Mr. MARRINER: Four shillings is our maximum price. (Disturbance.)

Mr. SHIELD requested order.

Mr. MARRINER: Our maximum price is 4s.; we cannot exceed that, let the price of coals be what they may. (Oh, oh!) But if we had to supply the whole parish, and let us have a chance and we will do it, we could reduce the price to 3s. 6d. ("Oh, oh!" and cheers.) [Mr. Pearse arrived at this moment, and was loudly cheered by his supporters, several of whom clapped him on the back as he made his way to the gallery where the chair was placed. For some minutes after his arrival general confusion and disorder prevailed.] Mr. Marriner proceeded, amid the most violent noise and clamour, to state that the company had upwards of three thousand written contracts, which would realize an income of more than £20,000 per annum. In addition to this, the verbal promises, and the increased demand consequent on the reduction of price, would enable them to realize £30,000 per annum. The new company offered to the ratepayers and gas consumers the advantages of cheap and good gas precisely on the same principles as those adopted by the Great Central Company in the city of London. (Confusion.)

Mr. HEWLETT: I want to know who is G. F. Argles?

This question was taken up and reiterated several times by Mr. Pearse, who offered a sovereign to any person who would go and fetch him. This produced general disorder, which continued for several minutes; nine or ten persons were speaking at once, most of those around the chair being engaged in personal squabbles.

Mr. MARRINER said that Mr. Hewlett thought no one had a right to go into a neighbourhood and canvass for customers until he had first opened his shop; but would any prudent man feel himself justified in opening an expensive establishment before he had first ascertained the probable amount of support? With regard to Mr. Argles, he was a gentleman; he was not Mr. Holman's clerk, and never had been. He never had any connection whatever with Mr. Holman. The directors of the company were honest and honourable men. Their names, and those of the promoters, were on the prospectus (which Mr. Marriner then held up to the view of the meeting), and he defied any one to accuse any of them of dishonesty, or anything derogatory to their character. (Cheers.)

Mr. HEWLETT wanted permission to address the meeting, but, not being permitted, the disorder was renewed with greater intensity.

Mr. ROBLOW, amid the wildest uproar, moved a vote of confidence in the new company.

Mr. M'DOWALL seconded the motion; but it was impossible, when the question was put by the chairman, to ascertain its fate.

Mr. PEARSE claimed a hearing, but he was firmly resisted by several persons on the ground that he was not a ratepayer.

A vote of thanks was then given to the chair, and Mr. Sandars immediately declared the meeting at an end. The uproar continued, however, for upwards of fifteen minutes longer, as the largest portion of the assembly could not tell whether or not the business was concluded.

At the conclusion of the proceedings something very like intimidation and coercion was attempted to be exercised even towards the reporters on the part of the supporters of the new company. A demand was made upon them that they should represent to the public that the uproar had been created by "lamplighters" and officers of the old company; but, judging from their own sense of hearing and seeing, that if it were really the case, they were equally matched by the partisans of the other side.

[Mr. Pearse requests us to correct an error in our report of his remarks at the meeting held at the Lord Tyrawley Tavern on the 27th of August. He is represented to have stated that the "Imperial Gas Company had been working for eighteen years before they paid 1s.;" whereas what he said was, that they had worked for eighteen years, receiving only 5 per cent. dividend and no bonus, and that now, in the twenty-eighth year of their existence, the shareholders only received 6 per cent.—ED. J. of G. L.]

MARYLEBONE VESTRY.

Saturday, the 4th instant, was the day fixed for the reception of tenders for lighting the public lamps of this extensive parish. The present contract with the Imperial Gas Company has yet several years to run, but, being determinable at the option of the vestry every three years, it was deemed advisable to invite public competition, and considerable anxiety was manifested by the parties interested in the result.

The CHAIRMAN said that day had been appointed by the vestry for receiving tenders for the future lighting of the parish with gas, but before they were opened he wished to read a communication he had received on the subject, addressed to the vestry.

The Vestry Clerk then read a resolution sent up by "The Marylebone Gas Consumers' Protection Committee," requesting the vestry to postpone their decision on any gas contract until Saturday, the 11th, when they would present a memorial signed by ratepayers on the subject.

Mr. HODGES moved that the resolution be referred to a committee appointed on the subject, which was understood to be seconded, and carried.

A communication was also received from the Equitable Gas Company praying permission to continue their mains from James-street, Oxford-street, to Hyde-park. There were also prepared to enter into contract to light all that portion of the district of Marylebone, including the public lamps north of Oxford-street to the south side of Mortimer-street and Charles-street, extending to the eastern side of Great Portland-street (the district now lighted by the Chartered Gas Company). They were prepared to supply the consumers who paid a rental of £3 per quarter at 4s. per 1000 cubic feet, and all under that amount at 4s. 6d.; and, if their contract were accepted, they would undertake to have all their mains laid, and the public lamps lighted, in three weeks. On the tenders being opened, the Equitable Company offered to light the public lamps with fish-tail burners, consuming three feet of gas per hour, at £2. 12s. per lamp per annum; four feet per hour, £3; and five feet per hour at £3. 8s. per annum. The tender of the Chartered Company was the same as the present contract for one, two, or three years at four guineas for the batswing burners, burning five feet per hour; and £3. 11s. for the burners consuming four feet per hour.

Mr. CLEMENT GEORGE said he had intended to have moved that the whole of these tenders be referred to the gas committee, but, from the liberal terms offered by the Equitable Company, and the advantages of competition it would afford, he would move that the tender of the Equitable be accepted.

Mr. WHITMORE seconded the resolution. The terms offered by the Equitable Company to private consumers were very much more just than those adopted by the Chartered Company.*

Mr. BACON only begged to express his regret that the competition offered by the Equitable Company did not extend over the whole parish.

Mr. M'EVILY moved, as an amendment—"That the tender of the Equitable Company, as well as the others, be referred to the gas committee." He admitted the advantages of competition likely to be conferred, but he thought they ought not to pledge the board to a contract without inquiry. The committee could investigate, and report next Saturday.

Mr. SODEN seconded the amendment. The subject was one of the highest importance, and he cared not how soon they were called together, but he thought all the matters respecting the supply of gas, including the Western Gas Company, should be referred at once to the committee.

Mr. NICHOLAY was as much an enemy to monopoly in gas as he was in all other articles of consumption, but he did not like the proceedings of new companies, who promised great things and did nothing. (Hear, hear.) He was glad to find the spirit of competition springing up amongst the old companies, but at the same time he was in favour of referring the whole matter to a committee.

Mr. STEVENS understood that the Imperial Company had not sent in any tenders, and, therefore, the vestry would be obliged to accept their tender as it at present stood. The parish would be much benefited if the other companies would extend their mains over the whole parish. (Hear.)

The CHAIRMAN said there some gentlemen in waiting from the companies on the subject.

Mr. GREEN moved that they be admitted.

M. D'IFFANGER, jun., seconded the motion. There were certain gentlemen trying to start a new company in that parish in which the majority of the parishioners had no confidence. (Hear, hear.) If, therefore, they could secure competition amongst the existing companies, a great deal of confusion and turmoil now going on in the parish would be saved.

The motion for admitting the deputation was put and negatived; and the communication from the Equitable Company and the tenders were referred to the gas committee by a large majority, and a special vestry ordered to consider their report.

## SURREY CONSUMERS' GASLIGHT AND COKE ASSOCIATION.

On Tuesday, the 30th ult., the first half-yearly meeting of this company was held at the Bridge-house Hotel. In the absence of James E. Douglas, Esq., THOMAS POCOCK, Deputy Chairman, presided.

The CHAIRMAN, in opening the proceedings, said:—Gentlemen, I feel that I am placed in a position that I did not anticipate to-day. I felt confident that our respected chairman would on this occasion preside over us. We have, however, received a letter from him, stating that business of great importance prevents him appearing among us; it has therefore devolved on me to take his position, and, in endeavouring to fulfil the duties which would have been much better discharged by him, I cast myself entirely on your indulgence. It is now about six months since we had our last meeting in this room. On that occasion we were on the eve of commencing our works at Rotherhithe. We have had immense and laborious difficulties to contend against during that period; but, by patience and perseverance, we have overcome a large amount of them. I have now a confident hope that in a few months we shall be in as prosperous a position as we could anticipate—a position which will be perfectly satisfactory to every shareholder. I can assure you that no exertions will be wanting on my part, or on the part of my brother directors, to bring about that desirable result. The shareholders who only meet us here once in six months have but a very imperfect idea of the daily mental and bodily labour of the directors. (Hear.) I believe that this company will be as profitable as any ever established. (Hear.) We look now to the co-operation of the shareholders and the consumers to make the undertaking profitable to ourselves and advantageous to the public. Many gentlemen in this borough often say to me, "How are you getting on? When will the district be lighted?" as if the directors could do these things by legerdemain. The whole of this depends on the shareholders themselves. They must provide money—the sinews of war. Let the shareholders be punctual in paying their calls, and then the undertaking will be crowned with success. With the ready money in our hand we will be enabled to go into the cheapest market, and conduct our business on the most economical principles. Recollect that we have to enter into competition with powerful companies, and this we cannot do successfully unless you supply us with the means. We have been compelled to enter into this competition; we have not done so from a voluntary desire to oppose existing companies; we have been driven to it by necessity. If the old companies had listened to our reasonable request, I believe you would never have seen this company in existence. If those companies had only offered to supply gas at 5s. per thousand cubic feet, nineteen out of twenty of the consumers would have gladly received it at that price. They said, however, that they could not supply us for less than 6s. We then said, "We must supply ourselves;" therefore this company sprang into existence from necessity. (Hear, hear.) I hope now you will all earnestly labour for the benefit of the consumers generally, and that you will endeavour to multiply consumers and shareholders. We are now established. Our works are built, our pipes are laid, and our gas is burning. When you consider that it is only six months since we laid the first stone, you will acknowledge that we have done a large amount of work. (Hear, hear.) I trust, therefore, that you have no room to find fault with the directors. (Hear, hear.) I now call on the secretary to read the report.

Mr. S. H. POWELL, the secretary, read the report, from which it appeared that the works had been completed at Rotherhithe, and some of the public lamps in that neighbourhood had been lighted on the previous evening. The local authorities and commissioners, with one exception—namely, Southwark—afforded every facility to the company. The districts to be immediately supplied are Rotherhithe, Bermondsey, and Deptford. Many of the shareholders are in default from nonpayment. In pursuance of a power, granted to the directors in April last, of borrowing £20,000, they have raised £8000, and they hope that no further exercise of that power will be necessary. In consequence of some informality in the proceedings of the meeting of the 31st of March last, it was thought necessary to confirm the proceedings of that meeting. The directors could assert without fear of contradiction that in no one instance had a company erected such extensive works with so small an amount of capital. The report concluded by calling upon the shareholders to pay up their calls, and thus add to the value of their investment.

The minutes of the meeting of the 31st of March were then read and confirmed.

The following is the balance-sheet, a copy of which was placed in the hands of each shareholder as he entered the room.—(See next page.)

The CHAIRMAN having moved the adoption of the report and statement of accounts,

Mr. BRICKHILL said he did not wish to cast any blame upon the directors, but he wished to know how much was due to the solicitor beyond the £17,950 stated on the balance-sheet to be due to the creditors.

The CHAIRMAN: That is a question I am not able to answer. The solicitor, however, is here, and he is old enough to answer for himself.

Mr. JAMES said the balance-sheet was made up to the 30th of June. The directors, finding that the business in connection with the company was very arduous, did not require him to make up his bill until what was termed the long vacation. That was now being done. One reason for not pressing the delivery of the bill was that the directors were not now going to pay it; and he was one of those good-natured creditors who would rather see the company successfully carried out than have his bill paid, particularly as he was not in want of the money.

Mr. BRICKHILL: That is not an answer to the question. I wish to know the amount of your bill as nearly as you can state it, because I think yours is the heaviest sum due.

Mr. JAMES: I hardly think it is a fair question to put. My bill extends over two years and a half, and if I make a statement it may be prejudicial to me; for subsequently it may be stated that I should be bound by it. My impression, however, is that, as the matter now stands, my bill will not exceed £800.

Mr. BRICKHILL: I am glad to hear that, because I heard it named at £2500.

Mr. JAMES: I am not answerable for those reports.

The CHAIRMAN, having complimented Mr. James on his honesty, integrity, and straightforward dealing, and for the great interest he

* This speaker must have been misinformed on this subject, as the Chartered Company have for some time past supplied the private consumers in this district on the terms now offered by the Equitable Company.

SURREY CONSUMERS' GASLIGHT AND COKE ASSOCIATION. BALANCE-SHEET, 30th JUNE, 1851.

| *Dr.* | £ s. d. | £ s. d. |
|---|---|---|
| To Creditors, exclusive of amount remaining due to the company's solicitor .. .. .. .. .. | | 17,957 8 6 |
| To Capital, viz.— | | |
| Deposit on shares .. .. .. .. .. | 110 14 0 | |
| Deposit on shares not taken .. .. .. .. | 0 5 0 | |
| First call of £1 per share .. .. .. .. | 2,360 15 0 | |
| Second call of £2 per share .. .. .. .. | 4,298 0 0 | |
| Calls paid in advance .. .. .. .. .. | 700 0 0 | |
| | | 7,279 14 0 |
| | | 25,237 2 6 |

| *Cr.* | £ s. d. | £ s. d. |
|---|---|---|
| By Cash at bankers .. .. .. .. .. .. | | 3,607 12 0 |
| Debtors for calls on shares, &c. .. .. .. | | 1,492 2 4 |
| Outlay on works .. .. .. .. .. .. | 16,257 5 10 | |
| Surveyor's charges .. .. .. .. .. | 25 0 0 | |
| | | 16,282 5 10 |
| Office furniture and fixtures .. .. .. .. | 111 15 0 | |
| Gas fittings .. .. .. .. .. .. .. | 18 6 2 | |
| | | 130 1 2 |
| Compensation for non-completion of agreement to purchase the piece of land on the north side of the Rotherhithe New Road .. .. .. .. | | 430 0 0 |
| Expenses, viz.— | | |
| General charges .. .. .. .. .. | 516 13 7 | |
| Salaries .. .. .. .. .. .. | 925 15 3 | |
| Rent and taxes .. .. .. .. .. | 830 13 3 | |
| Law charges .. .. .. .. .. .. | 250 8 7 | |
| Stationery, &c. .. .. .. .. .. | 467 16 10 | |
| Canvassing .. .. .. .. .. .. | 143 2 9 | |
| Interest on loans .. .. .. .. .. | 160 10 11 | |
| | | 3,295 1 2 |
| | | 25,237 2 6 |

took in the success of the company, said he was happy to be informed that the bill was so far below what any shareholder could have anticipated.

Mr. BRICKHILL said he did not wish to be troublesome, but he saw in the account £516. 13s. 7d. for general charges. What did they consist of?

The CHAIRMAN said those charges went over the whole time since the company was commenced. Mr. Hutchinson, their late engineer, was the originator of the company, and a large part of those expenses was incurred under his management. There would not, however, be such a "lumping" of the accounts in future. Hereafter the statement would be confined to the six months' expenditure. At present there was a vast amount of matter of which they could not give an explicit account. They had had a great deal of trouble with this Mr. Hutchinson, who brought an action against the company, which action was decided some months ago. They were under a promise and engagement to him to pay him £300; but, by the result of the action, they got rid of that liability.

Mr. BRICKHILL was surprised to find £3295 knocked up in seven lines for expenses. There was £925 for salaries, and they had only just begun business. He wished to know how those salaries were spread—in what proportions they were paid?

The CHAIRMAN said they were only new beginners, and they were employing no more persons than were absolutely necessary. Last week their engineer said they required two inspectors, but the directors would only employ one. They wanted no drones. For the last fifteen months they had been acting on the most careful, cautious, and economical principles, and they should continue to do so. A greater part of that £3295 was incurred before the present directors came into office; but from this day forth they should start on different principles.

The SECRETARY said the "general charges" included the expenses of public meetings at Hawkestone-hall, Dockhead, the Literary Institution, and several other places.

Mr. ILLIDGE: Perhaps you would be kind enough to read the items.

The SECRETARY: I have not got them here.

Mr. FARTHERLY congratulated the company on the favourable position of the works, and hoped each shareholder would endeavour to extend the number of shareholders and consumers.

Mr. BOWDITCH then seconded the motion, and it was carried unanimously.

Mr. FARTHERLY then moved—"That the thanks of the meeting are due and hereby given to the directors for the time and trouble they have bestowed on the association, and for the successful position in which it at present stands, and also to the other officers for their proper conduct in their several departments."

Mr. BATT seconded the motion.

Mr. ILLIDGE said there were several directors in the room who had not visited the works for six or seven months. He objected to giving a vote of thanks to them. He wanted men that would work, and not persons who were mere ciphers in the place.

The CHAIRMAN hoped his friend Illidge would withdraw his objection. It was wrong to make any difference between one director and another; for those whose labour had not been so prominent had been useful in other ways.

After some conversation the motion was agreed to, and

Mr. PEPPERCORN returned thanks on behalf of the directors.

Mr. WADE moved—"That a vote of thanks be specially given by this meeting to the several parochial and other boards in the various districts proposed to be supplied by this association for the urbanity and kindness displayed by them, and particularly for the permissions which they so readily accorded to lay down pipes, &c.; and that the secretary be instructed to inform the several boards of the same." None of the boards, except one, had refused permission to pass through their streets. The company which withheld its consent (the Grand Surrey Canal Company) made an exorbitant demand, which the directors did not feel justified in submitting to. As their works were now erected at Rotherhithe he hoped they would not rest satisfied until they had the support of every consumer on the south side of the metropolis. This was a *consume*-ation devoutly to be wished. (No laughter.)

Mr. WHITE seconded the motion, and it was agreed to.

On the motion of Mr. BERESFORD, seconded by Mr. WHITE, the thanks of the meeting were given to the trustees, Messrs. Thwaites, Wade, and Bow, for the interest they had taken in the success of the company.

A vote of thanks was also accorded to the chairman, and the meeting separated.

## CITY OF LONDON COURT OF SEWERS.

The commission assembled in the Guildhall on the 30th ult.—Mr. Deputy Peacock in the chair.

Mr. H. L. TAYLOR moved—"That the resolution of the commissioner at their meeting held on the 16th instant, 'that in laying the 24-inch main, which the court have given the Great Central Gas Consumers' Company permission to do, from the west end of Cheapside to the east end of Leadenhall, that the work must be executed between the hours of seven o'clock in the evening and eight o'clock in the morning, under the direction of the surveyor of this court,' be rescinded, that company not having complied with the requirements of the 134th section of the City of London Sewers Act, 1848, or with the same requirements contained in the 30th section of their own act." He denied that there was any record in the books of the court showing that any permission of the kind had been given by the commissioners. The company's act compelled the company to restrict the hours of laying down pipes to the night, so that to pass such a resolution was quite supererogatory.

Several Members: It was agreed to unanimously, and there were twenty-nine members in the court at the time.

Mr. H. L. TAYLOR said it was possible, as was evident from that result that every individual in the court could be wrong. (Laughter, and loud cries of "Hear!") But, if permission had been granted, there must surely be some record of the fact, and he defied the supporters of the Great Central Gas Company to exhibit anything of the kind. It might, for what he knew, be a matter of policy to allow the pipes to be laid down according to the terms of the resolution; but it was a matter of certainty that any one who did not agree with the Great Central Gas Company in the construction they chose to put upon an act of Parliament must be altogether wrong. He, however, was prepared to say that it was in the power of any person who might be disposed to question the authority of the company to put an immediate stop to their proceedings in the district which it was proposed to disturb. Mr. Taylor concluded a speech in which he strongly condemned the conduct of his brother commissioners by moving that the above-named resolution be rescinded.

Mr. ELLIOTT seconded the motion.

Mr. Deputy OBBARD said he had listened with patience and with pleasure to Mr. Taylor; but, unlike that gentleman, he considered the spirit, and not the letter, of the act of Parliament. (Hear, hear.) He approved of the resolution, as calculated to be of beneficial operation to the public, inasmuch as the difficulties which must necessarily attend a work of the kind would be aggravated by the frost and snow of winter if a postponement were to take place. It was to be regretted that Mr. Taylor was not present on the day the resolution he condemned was brought forward. Probably the ready adoption of it was attributable to the absence of a gentleman who was sure to be always in the right, and who, of course, was perfectly justified in saying that all the other members of the court were in the wrong. (Laughter.) It was to be regretted, too, for the sake of Mr. Taylor's motion, that the number of members necessary to rescind a motion must be larger than the number gathered together when it passed, so that there was more than the necessary calamity attending the experiment. (A laugh.) As for the suggestion that it was in the power of anybody to put a stop to the work altogether, he was very glad to hear that, for he really wished to see the question settled. He supposed that the course recommended by Mr. Taylor would be a proceeding at law; and no doubt, as the public would soon know all about it, some public benefactor would come forward and try the experiment. (Laughter.) He thought, in the meantime, the best thing he could do was to move the previous question.

The previous question was then carried.

Mr. WHITESIDE then rose to propose the following resolution:—"That so much of the resolution of the commissioners passed at their meeting on the 16th inst., in reference to the Great Central Gas Consumers' Company, as restricts the time for laying down their main from the west end of Cheapside to the east end of Leadenhall-street, to between the hours of seven o'clock in the evening and eight o'clock in the morning, be rescinded; and, that it may be completed with the utmost despatch, the said company be allowed to execute such work by day as well as by night, under the direction of the surveyor." He was convinced it would be advantageous to the public to allow the company to proceed with the work with the greatest rapidity, and it was quite evident that they could lay their pipes more securely and effectively by day than by night. The consequence of the permission would be that the inconvenience which in such a thoroughfare must arise from the obstruction would be of comparatively very short duration.

Mr. HALL, of Bishopsgate, seconded the motion, in doing which he

looked, he said, to the great advantage likely to ensue to the public, without at all taking into consideration the benefit to the company arising from the more firm and perfect condition of the work. He believed that, if the motion were agreed to, the inconvenience would be at an end in a fortnight instead of six or seven weeks.

Alderman Lawrence admired the indiarubber consciences of some gentlemen, which were capable of being extended to any size, to embrace any proposition, however formidable and monstrous. (Laughter.) It appeared, from the manner in which some of those gentlemen spoke, that the disturbance of the pavement now in Cheapside would be productive of no more than ordinary inconvenience, which could be easily remedied by sending the omnibuses and vehicles of all other kinds down the by-streets and alleys. (Laughter.) Why, at the present moment there were great difficulties in passing along Cheapside. To contemplate for a momant the increase of confusion which must inevitably arise from the disturbance of the pavement there, or in any of the other great avenues of traffic in the City, would surely check the notion of such an experiment. It was, besides, just as easy to lay down mains in the night as in the day. He was glad that the act limited the gas company's operations, in laying down mains and pipes, to the nighttime, and he was convinced that the removal of the pavement under any circumstances ought to be subjected to similar restrictions. (Hear, hear.) He was sure that no more than ordinary skill was necessary in laying down gas pipes, and if the company had not in their employment men who were able to do the work properly during the hours of labour it was their own fault, and they must take the responsibility. (Hear, hear ) He concluded by heartily protesting against any proposal of a deviation from the act of Parliament which they had procured for their own government, and calling upon the commissioners to negative the motion of Mr. Whiteside.

Mr. Deputy Harrison said that nothing but a great emergency could justify the disturbance of the pavement in a large thoroughfare. He knew that in Aldgate numbers of the inhabitants had complained at the commencement of the labours of the Great Central Gas Company of the serious inconvenience which they suffered from the disturbance of their rest; and he knew that in many localities expedition was wished at any cost or hazard; but he was decidedly of opinion that the court ought not to alter the resolution to which they had come as to the laying down of the pipes in the nighttime. (Hear, hear.) He at the same time admitted that in extreme cases it would be necessary to vary the rule temporarily, and he instanced the case of the discovery of a well in Leadenhall-street on the preceding night, by which the works in that locality were necessarily suspended.

Mr. Elliott requested to be informed whether the question before the court was introduced with the concurrence or consent of the Great Central Gas Consumers' Company? (A laugh.)

Mr. Dakin (the chairman of the Great Central Gas Company) immediately appeared at the bar of the court, and said the Great Central Gas Company entertained no wish at all of the kind; that they were perfectly aware of the inconveniences to which it would inevitably lead, and were not at all a party to the application. (Hear.)

Mr. H. L. Taylor said it was useless to talk of the act of Parliament, for no act of Parliament that could be framed would ever bind that company to do what was right. (Great laughter.) It was said that a coach and six could be driven through an act of Parliament. The Great Central Gas Company felt great ease in performing that feat, to his knowledge. (Laughter.) They had done so already, and they would drive the same vehicle and cattle through any act of Parliament that could be made. ("Hear, hear," and laughter.")

Mr. T. H. Hall said that, whatever the majority in favour of the Great Central Gas Company might be in the court, they certainly had a sturdy opponent in Mr. Taylor, who really appeared to go further in imputing motives than he was aware of himself. He (Mr. Hall) was influenced in the course he followed by the beneficial operations of the company with regard to the public. (Hear, hear.) He entertained no doubt at all of the good intentions of the company, neither had he any doubt that everything that ought to be done would be done, under the authority of the commissioners; and he believed that the hurry to which the workmen were driven during the extensive operations which were undertaken at the commencement led to the imperfect performance, which would soon be remedied by time and experience. (Hear, hear.)

Mr. Elliott said that so much had been done contrary to law, in opposition to plighted faith and to their honour and character, by the commissioners, that, in his opinion, they ought to go the whole hog. (Great laughter.) He considered that the Great Central Gas Company were influenced in their proceedings by an honourable principle, and that the commission, like a dignified body, as it was, ought to take upon itself to exonerate them from all blame, to free them from all responsibility. (Laughter.) For his part, he had abstained from all hostile feeling towards the company. To the commissioners he attached all the responsibility. He admitted that the pipes could be better laid down by day than by night, and that the company very reasonably requested the permission which would enable them to accomplish their object more effectually. He hoped his friend (Mr. H. L. Taylor) would apply his talents by and by to the adoption of means to accomplish those reforms in the corporation which would be likely to put an end for ever to the system of jobbing, of which the existence of the new Central Gas Company was an example.

Mr. Whiteside replied: He confessed that he had been an advocate for the new company, but it was because he was an advocate for the interests of his fellow-citizens. (Hear.)

The motion was then put and negatived, and, after some business of minor importance, the court adjourned.

[In spite of the above decision, and apparently without leave or licence, Cornhill has been opened almost from end to end during the day-time, and a large main laid in the middle of this leading thoroughfare.]

## REPORT ON THE NATURE AND PRODUCTS OF THE PROCESS OF THE DESTRUCTIVE DISTILLATION OF PEAT.

By Sir Robert Kane,
*Director of the Museum of Irish Industry.*

[Continued from page 177.]

Mr. Reece's statement of the produce from 100 tons of peat distilled is compared with the average results of the Museum trials in the following table:—

| From 100 parts of peat. | Statement in Mr. Reece's Prospectus. | | Average results of Museum Trials by blast process. |
|---|---|---|---|
| Sulphate of ammonia | 1·000 | .... | 1·100 |
| Acetate of lime | ·700 | .... | ·305 |
| Wood naphtha | ·185 | .... | ·140 |
| Paraffine | ·104 | .... | ·125 |
| Fixed oils | ·714 | .... | 1·050 |
| Volatile oils | ·357 | | |

From this comparison it is evident that the quantity of ammonia obtained is rather greater than that expected by Mr. Reece; secondly, that the quantity of paraffine and of oils may be considered the same; thirdly, that the quantity of wood naphtha expected by Mr. Reece is more than we obtained in average, but not more than was obtained in some Museum trials. That the quantity of acetate of lime expected by Mr. Reece is more than double that which was in average obtained in the Museum, unless the commercial acetate of lime, calculated for by Mr. Reece, shall contain such excess of lime, &c., as shall render its weight double that which the pure article, calculated in the result of the Museum trials, should have. This latter circumstance may possibly explain the difference.

It may, therefore, be admitted that the statements made as to the quantities of those bodies obtainable from peat have not been exaggerated; and, indeed, are such as should immediately be inferred to be obtainable from a body of its constitution compared with coal and wood.

It being thus determined as to the amount of produce, it remains to consider how far the practical circumstances of the operation may influence the feasibility of the manufacture on the great scale. On this suject, so difficult to decide positively, even in the case of a manufacture well understood and practised, when it has been introduced to a new locality, it becomes impossible to arrive at absolute conclusions where the manufacture itself is one of novel character, involving numerous and complex collateral operations, and is proposed to be established in localities and amongst populations unaccustomed to manufacturing industry. I can, therefore, in this report only notice in very general terms some conditions of Mr. Reece's processes, which, as it appears to me, will be found materially to influence the cost of production of the several substances which it is proposed to bring to sale.

Mr. Reece's patent, it will be observed, is merely for the application of the blast of air to obtain, by distillation, the tarry and gaseous products of the peat. But, as first obtained by distillation, those products are all in a condition excessively impure; and there will be required for their separation and purification special and complex chemical operations. The distillation of the peat must, in fact, be looked upon as the only means of obtaining what are, in reality, the raw materials of a number of chemical manufactures, just as by the distillation of coal there are obtained gas liquor, which forms the basis of a special ammonia manufacture, and gas tar, which gives occasion to naphtha, oil, and pitch making, while these are only collateral or waste products compared with the gas and coke on which alone the managers of gas companies find it worth while to fix their own attention.

These materials, however, obtained as residues of more important manufactures of charcoal and coal gas, must be considered as in themselves having but very inferior commercial values, and the price of the product obtained from them is almost altogether determined by the expense of the subsequent purification and extraction of those products in a commercial form. Hence the value of the process in a manufacturing point of view depends on two conditions—first, that materials shall be supplied at an extremely low or nominal cost; and second, that there shall be such economy in the processes of manufacture as that the final cost shall be below that of the same products as now made. It is evident that in the distillation of a quantity of peat to obtain tar, ammonia, acetic acid, and naphtha, there must be employed a quantity of fuel, which, by the process of Mr. Reece, is made to be actually that under distillation, which, as it cokes and descends in the furnace, is burned by the blast, and supplies the heat necessary for the distillation of the superincumbent layers. Whether actually all the coke requires to be thus burned in each operation cannot be positively asserted until the process shall have been continuously carried on on the great scale; but it would be, as I believe, imprudent to calculate on any portion of the coke of the distilling furnace being directly available for any other uses, or being a source of independent profit.

The cost, therefore, of the tar and liquors for the subsequent manufacture will be equal to that of the entire quantity of peat employed, together with the cost of erecting, maintaining, and working the distilling and condensing apparatus. The arrangement of these latter will, however, be probably found to require serious consideration; the furnaces being in form and dimensions similar to the high iron furnaces, and being required to constitute, when in action, true gas retorts, air-tight, in order that the products may be blown through the condensing apparatus. It will probably be found that an amount of pressure will be required to be used with the blast machinery that may render its expense a very appreciable item in the cost of production, as it must be recollected that, although the proposed manufacture may be represented as a combination of the arrangements of an iron works with those of a gas works, yet it will be observed

that the relations of the products are just reversed, the volatile products of the iron furnace being usually waste, whilst in the peat process they are those sought. On the other hand, in gas works the condensible vapours are little valued, and are condensed only to purify the permanent gas, which is the important product; whilst in distilling peat the condensible vapours form the commercial materials, and the gases have no direct value. There is, therefore, the grave difference between the condensation in the gas works and in the peat works—that in the former, provided the gas will burn without bad smell, the more it is loaded with carbo-hydrogen vapours, and the higher specific gravity it possesses, the more brilliant light it gives and the higher value it possesses. Hence the condensing apparatus may be the minimum that will remove the gross impurities; but in the peat works, the gases being of no commercial value, and the condensed products being those to be afterwards sold, everything that escapes condensation is a money loss, and the apparatus for effecting condensation will require to be of the most perfect description.

It is quite certain, however, that the condensation can be effected with success by means of suitably-extended and cooled apparatus; but, considering that all the products issuing, at a very high temperature, from two furnaces burning together 100 tons of peat every twenty-four hours, and accompanied by a current of at least 200 tons of atmospheric air (the volume of which may be estimated at 215,000 cubic yards), and possibly twice as much, and referring to the difficulties of condensation which were felt even in the experiments on a small scale conducted in this laboratory, and to the circumstance that at Newtown Crommelin the process of distillation went on excessively slow, being only at the rate of from 1½ to 2 tons of peat per diem in the largest furnace that has been as yet used, it will appear natural to expect that the perfect condensation which should afford, on the great scale, the realization of the entire products may be found to require apparatus of a magnitude very far exceeding anything as yet proposed.

It therefore requires to be considered that in the peat-distilling process the materials from which the commercial products are to be obtained will cost the outlay on the peat employed, the charge of erecting, maintaining, and working the furnaces, and of blast machinery, and of the condensation apparatus; and these materials, when so obtained, are similar to those obtained as residues from wood and coal distilling processes, and available at present, at very low prices, for further manufacturing objects.

Under these circumstances, it must evidently be, in great part, by the introduction of improved and more economical modes of treating those new materials that the manufacture proposed by Mr. Reece can be conducted with practical advantage. These improvements do not form any part of Mr. Reece's patent, nor are any of them of individual novelty. They consist, as far as I have had an opportunity of judging from the communications made by Mr. Reece, and by his answers to queries, in two points—1st, separative distillation; and, 2ndly, in the employment, as fuel, of the gases given off from the furnace. The necessity of the first economy arises from the circumstance that the quantities of acetic acid, of ammonia, and of pyroxylic spirit, obtained by the distillation of peat, are diffused through so large a mass of watery liquor, that their separation, after treatment with lime and sulphuric acid, respectively, by the ordinary processes of distillation, would become tedious and expensive. In this respect, however, the adaptation by Mr. Reece of the principle of separative condensation will, as I believe, prove highly useful, and in this respect probably secure the most economical manner of operating that could well be devised. This branch of the operations, however, does not enter into Mr. Reece's patent, being rather connected with the employment of the form of rectifying still invented and patented by Mr. Coffey, of Dublin, some years ago. It will certainly be, however, questionable whether this economy, although useful and ingenious, can affect in any very material degree the final result of the manufacture, as it regards only one stage of the preparation of one or two articles which are not more specially valuable than several others it is proposed to obtain.

The much more important attempt to reduce the cost of extracting from the raw products the several articles proposed in a commercial form, and, indeed, of conducting with economy the actual blast distillations, consists in the application as fuel of the gases produced in the blast-furnaces by the distillation of the peat; which gases, as they will issue from the extremity of the condensing apparatus, after all the tarry and watery products shall have been condensed, should be made, by their combustion, to supply the heat required for all the distillations and evaporations necessary in the several branches of the manufacture, and also to heat the boilers for the steam-engines to work the blast machinery, and the other machinery of the works. For this purpose Mr. Reece has kindly explained to me that it is proposed to carry the gases which escape from the extremity of the condensing apparatus into a system of underground flues, which shall ramify, as gas-mains ramify in the streets of a city, to the several localities of the works where furnaces are erected. At the point where each branch flue opens into the furnace will be adapted a mechanism for regulating the entrance of the gas; and there being, by means of a chimney of great height, a draught of air established, also regulated by mechanism, so that the combustible gas and air shall bear a proper proportion to each other, the condition for using the waste gases as fuel should be fully realized in theory.

The employment of such waste gases as fuel had been long since proposed in the case of iron-smelting works, where vast quantities of carbonic oxide and other gases escape from the tops of the high furnaces; and those gases had been, in many cases, successfully conducted to the hearths of the puddling and refining furnaces, where their flame served to economize a certain quanty of ordinary fuel. Hence the proposition of Mr. Reece, to treat in a similar manner the waste gases of the peat-furnaces, merits full consideration. It is in theory certainly quite possible to effect it. At the same time it must be borne in mind that the economy and practical advantage of the plan have not been found, even in iron-smelting works, so absolute as to produce its universal or even general adoption, and yet in iron works the arrangements are much more simple; the gas conduits would not require the same exact arrangement for supply, and, what is of the greatest importance, the gases are used from an iron furnace very hot, and are found to require to be so used in order to enable them to serve as fuel.

The employment of the waste gases as fuel does not appear to be considered by Mr. Reece, as in the iron works, an accessory and secondary economy, but forms so great an object that, as stated in his prospectus, "in distilling 100 tons of peat, a quantity of inflammable gas is obtained, equal in value to 20 tons of coal," that is to say, of nearly equal heating and money value to the entire body of peat by which it was produced. This, however, could not be the case even by distillation in close vessels, where all the carbo-hydrogen gases could be economized, and becomes quite impossible where the distillation is carried on by blast, and the carbo-hydrogen and carbonic oxide must issue mixed with the whole volume of nitrogen of the enormous body of air that had been blown in, as well as with the very large quantities of carbonic acid derived from the distillation as well as the combustion of peat.

But it appears evident that Mr. Reece calculates on effecting all the boiling, evaporating, and distilling operations of the various special manufactures by means of these waste gases only, as there is not found in his estimate any item for cost of fuel, beyond the actual peat that is to be distilled; and in his prospectus it is proposed to employ the gases in even further subsidiary processes, as burning lime, carbonizing peat, &c. It does not appear to me that the successful employment of those gases could be calculated on to so great, if to any great, degree, and in the special report there will be found the detailed evidence that the gases issuing from the blast-retort, where the process of Mr. Reece was carried on, were scarcely and only at times at all inflammable, and could not be in any way depended on for steady combustion, or as a regular supply of heat. There will be found also the details of experiments on the combustibility of mixtures of inflammable gases (carbonic oxide, and carburetted hydrogen), with such volumes of nitrogen as the blast of air should at least supply in Mr. Reece's process; and the result appears to be, that although such mixtures may, by careful management, be set on fire, yet no dependence could be placed upon a current of such gaseous mixture burning continuously, and that a manufacturing process requiring heat should not be left dependent on such a fuel.

It will be remarked that I have here spoken of the combustibility of those gases, as they issue cold from the extremity of a condensing apparatus of a very perfect kind. It is this particular which prevents the success obtained in the employment of similar gases in iron-smelting operations from being a fair analogy. The gases are conducted from the body of an iron furnace, strongly heated, by short channels to the flame beds of other furnaces, and their combustibility is greatly enhanced by—indeed arises from—their high temperature: besides which they are used only as subsidiary to already existing fires, being never, that I am aware, taken as the only fuel on which important operations should be left exclusively to depend.

It is not my wish to enter into any examination of the minute details of the processes of purification and preparation of the commercial substances from the raw products of the manufacture. These processes do not form any portion of Mr. Reece's patent, and the only statement regarding the plans proposed to be pursued is that in the article on Mr. Reece's project published in Mr. Dickens's journal, "Household Words" (January, 1851), which account, however, Mr. Reece has, in his answers to queries, adopted as authentic. There will be found in the description of the experiments some facts regarding the action of sulphuric acid on the tar from peat, and its power of separating the resins, which will render it doubtful whether the process may not be more expensive than Mr. Reece would appear to suppose, and, in fact, whether other modes there indicated might not be found more advantageously applicable than that proposed to be adopted by Mr. Reece.

In reference also to that process it may be remarked, that as some million of pounds weight of oily and fatty material are to be bleached annually, and that the bleaching is proposed to be effected by means of bichromate of potash, a salt of very high commercial value, no item of the cost of that salt is given in the estimate of outlay, nor is there any notice of its recovery, or of the source, other than ordinary purchase, by which it is to be obtained. Yet, operating on such enormous quantities, it should be taken into account, as, if not recovered in some economical manner, it might seriously affect the cost of production of those fatty and oily bodies, on which so much of the productiveness of the proposed manufacture depends.

There will be found in the report of special details the facts regarding the processes for obtaining the paraffine and oils out of the tar, and some suggestions by which methods of greater effect than those described as Mr. Reece's could be employed. The most remarkable result, however, is that the resinous bodies which, in Mr. Reece's processes, are separated by means of sulphuric acid, and are rejected as valueless, are themselves capable of conversion into paraffine (so called), and thus the quantity of that solid fatty material obtained from the peat may be rendered much larger than what had been supposed by Mr. Reece to be possible.

I shall not refer to any other circumstances of the cost of purification, and bringing to marketable form the products of distillation, as I do not feel that it would be within my object to discuss the actual money estimates that have been put forward in the prospectus of the company proposed to be established.

From those considerations of the results of the experiments made in the Museum of Industry, and the trials at Newtown Crommelin, and of the circumstances of the manufacture of the same products from the other species of fuels by processes more or less analogous, it appears to me that some general conclusions may be deduced:—

1. That the quantities of ammonia, of wood spirit, and of so-called

paraffine, fixed and volatile oils, stated by Mr. Reece to be obtained by distillation from peat, do not appear to be exaggerated, as they fall within the limits of the results obtained in the Museum laboratory, and approach closely to the average results. That the quantity of acetic acid or acetate of lime, stated by Mr. Reece and Dr. Hodges, could not be obtained, the result of the Museum trials affording but from one-half to two-thirds of the expected quantity of that substance. That, further, the produce of paraffine may possibly be rendered much more considerable than was stated by Mr. Reece, through a more judicious treatment of the resinous materials of the tar than had been proposed by that chemist.

2. That the distillation with combustion of the peat in the blast-furnaces must be considered to produce only the raw materials for the subsequent chemical operations, just as in the processes of wood or coal distillations there are produced tar and ammonia, and acetic acid, which have long been the objects of manufacture.

3. That those materials, if charged with the total cost of the peat consumed, the cost of erecting and working the furnaces, the blast-engines, and condensing apparatus, and proportion of management, would not appear to be very much more economically obtained from peat than they are now obtained from the products of wood and coal distillation, where they are sold at very low prices, and at least, as regards gas tar and gas liquor, in most places in Ireland have been regarded as waste products.

4. That the principal value of the class of products obtained from peat is derived from the cost of their subsequent purification and conversion into a commercial form, and that, consequently, the principal advantage of a new mode of obtaining them must be looked for in the more economical treatment of those materials.

5. That to this principle the extraction of the paraffine may be an exception, it being itself a material new to commerce on a large scale, and hence not having its value determined by the comparative economy of preparation from sources of little value.

6. That the economies introduced in the treatment of the tarry and watery products of peat distillation are reducible to two (so far as I have been able to learn):—1. The separation of the wood spirit by means of an improved distilling apparatus; and 2. The utilization of the waste gases from the condensing-pipes, so as to supersede the use of other fuel by burning the gas in jets under the steam-boilers, tar and acetic acid stills, evaporating-pans, &c.

7. That the former economy cannot be of paramount influence, as it effects but one stage of the preparation of a single product, and further might be applied in a similar way to lessen the cost of production of wood spirit from any other source.

8. That the latter economy is of the most important character, and appears more than any other one condition to influence the probable success of the manufacture on the great scale; that, therefore, the amount of advantage derived from similar employment of gases in iron-smelting works will deserve careful comparison; and that it will be necessary particularly to take into account the difference of combustibility of gaseous mixtures when very hot, as when from an iron furnace, and when quite cold, as from the condensing apparatus of a peat-blast furnace.

9. That under the circumstances of a manufacture presenting so many new and complex processes, which, in analogous branches of industry, it is found convenient to separate and commit to different and individual interests, and that its conditions, as to the supply of peat, require its establishment in localities of but little industrial activity, it can scarcely be expected that even as much economy and advantage should be realized as might be expected after experience of the same process on a working scale and with trained labour.

10. That, although the excessive returns stated by the proposers of the manufacture may not be obtained, it is yet probable that, conducted with economy and the attention of individual interests, the difficulties connected with so great complexity of operations would be overcome, and the manufacture be found in practice profitable; and, certainly, it must be regarded as of very great interest and public utility that a branch of scientific manufacture should be established specially applicable to promote the industrial progress of Ireland, by conferring a commercial value on a material which has hitherto been principally a reproach, and by affording employment of a remunerative and instructive character to our labouring population.

## SELECT COMMITTEE ON THE METROPOLITAN WATER SUPPLY.

The evidence of one of the witnesses examined before this committee gives such an insight into the secret machinery by which the public mind is sometimes acted upon for the exclusive benefit of the clique of speculators by whom the agitation is set on foot, that we are induced to transfer it to our columns. The gentleman to whom we are indebted for this exposure is William Yates Freebody, Esq., civil engineer, chairman of the council of the Metropolitan Sewers and Water Association, director of the projected Marylebone Gas Consumers' Company, and possibly of a dozen other patriotic abortions similarly concocted. His cross-examination by Mr. Edwin James was to the following effect:—

6490. Has the Metropolitan Sewer and Water Improvement Association any connection with the Parochial Association, which we have heard so much about?—Not any.

6491. It is a totally separate association, and has no connection with it?—I think I have said so.

6492. When was the association first formed?—On the 10th of December, 1850.

6493. You were chairman?—Yes.

6494. The members of the council, I see, in December, 1850, are yourself, the chairman, of Duke-street, Westminster; Edward Ryde, Esq.; is he a civil engineer?—Yes.

6495. John Loude Tabberner, Esq., Piccadilly; who is he?—He is the witness who has just been examined.

6496. What is he?—I should describe him as a man of letters, what the French call *homme de lettres;* the French nation give some description to a man of letters; in English I do not know what to call him.

6497. George Shepherd, Esq.; was he a civil engineer?—Yes.

6498. George Wells, Esq., Somerset-house; who is he?—He is the receiver of the Admiralty proceeds.

6499. Is he in the Admiralty-office?—He is a receiver in the office.

6500. Is he in a Government situation?—I have never inquired of that gentleman, but I believe he is in a very responsible situation.

6501. Is he in a situation under the Government at the Admiralty?—I have only his own authority for it; I have heard him speak of the Admiralty Board as if he were in authority.

6502. He speaks like a man in authority?—Yes.

6503. William Murray, Esq., University-street; what is he?—He is an engineer, I think; I am not sure.

6504. Valentine Davis, Esq., King Edward-street, Islington; what is he?—An architect.

6505. David White, Esq., Walbrook, City; what is he?—He is a builder.

6506. Alfred Deacon, Esq., Henrietta-street, Brunswick-square; what is he?—He is a machinist.

6507. Those gentlemen whom you have described constitute the council of the Metropolitan Sewer and Water Improvement Association?—Yes.

6508. With power to add to their numbers; I believe you never did add to your number, did you?—Yes.

6509. Will you give me the list?—There were members of the council added, because Mr. Maberly's name appears, and Mr. Soper's, and Mr. Garling's.

6510. Where does Mr. Soper's name appear?—It appears upon the minutes. I cannot refer to the proper date when they were elected.

6511. Have you added other names which have been before the public?—*We have scarcely cared about the public.*

6512. You cared about yourselves, I suppose?—*Yes. We have found the public very backward in coming forward.*

6513. And therefore you thought it best to take care of yourselves?—*Yes.*

6514. And that was the origin of the institution?—*Yes.*

6515. When was it you began to neglect the public and think of yourselves?—The object was to get a better water supply, and, if possible, to render the sewers more wholesome.

6516. When was Mr. Soper added; who is Mr. Soper?—I do not know.

6517. You added a gentleman, and you do not know who he is?—No; I was not always in attendance.

6518. Did you add Mr. Soper's name to the list without knowing who or what he was?—I presume it was explained by those who proposed him.

6519. I see you were chairman of the council; who was Mr. Soper?—I do not know.

6520. Who else is there who was added?—There was one added at the last meeting; I cannot charge my memory with his name. There is a gentleman named Garling.

6521. What is he?—I do not know.

6522. You mentioned Mr. Maberly; who is he; do you mean Col. Maberly at the Post-office?—A relative of his.

6523. Who is he?—I do not know.

6524. Is he in any profession?—Yes.

6525. What is his address?—It is near Fleet-street.

6526. Was he an engineer?—I think he was an engineer.

6527. Is there anybody else?—There was some one proposed at the last meeting, whom I also do not know. Mr. Hugh Fraser was added on June the 6th.

6528. What was he?—I cannot tell you. If a gentleman comes to that council, and says his object is a public one, we do not ask him who he is, nor where he comes from. He was proposed by Mr. Murray, and was seconded by Mr. Ryde, that he should be a member of the council; and it was put and carried.

6529. You did not know at all who Mr. Hugh Fraser was?—I did not.

6530. Where does he live?—His address does not appear to be here.

6531. Is there any other name you can give us as a member of this council who suggested to Lord John Russell what should be done with the sewers and the water supply?—There were a variety of people attended from time to time.

6532. Was there any constituent body of this council, any persons who elected you as members of the council, or did you elect yourselves?—A meeting was first called by public advertisement.

6533. Where?—It was called at Duke-street, Westminster, at my house.

6534. What is the date of the meeting being first called?—I believe the 29th of October; I will not charge my memory that that was the date.

6535. Who met?—There was no list of persons taken.

6536. Can you tell me of what the meeting consisted; you say it was called by advertisement?—By advertisement and circulars.

6537. Addressed to whom; the inhabitants of Westminster or the ratepayers of Westminster?—It was sent chiefly to those who had turned their attention to drainage and water improvement in London.

6538. Was it a general advertisement, or not?—It was made general afterwards.

6539. Who attended at your rooms?—I am hardly aware, there were so many strangers.

6540. How many people attended?—Perhaps thirty the first meetting; there was no list taken; there was an attempt made to get a list, I think, but I do not think there was any made.

6541. At that first meeting did you elect your council?—Yes; after the association was proposed it was settled what it should be called; Mr. Fowler, of St. Pancras, spoke against bringing in the water question.

6542. He spoke upon the sewage question, I suppose?—Yes; it was thought that the sewage evil was the greatest, which no doubt it is, because, if the sewers had a proper and bountiful supply of water, they would cease to be of that dangerous character to the health of the inhabitants of London that I believe they now are.

6543. Was this upon the question of the supply of water to the sewers or to the inhabitants?—Both; Mr. Fowler spoke against bringing in the water question, and I think he seldom attended afterwards.

6544. Is that where Mr. Soper advocated the water?—Mr. Soper explained as to the drainage on the north side of London.

6545. Can you tell me how many persons of the public nominated this council?—No; there was no list of the public kept.

6546. You think there were thirty people there?—I should think there were.

6547. Your room will not hold many more, will it?—It was inconveniently hot.

6548. How many people would make it hot; do you think there were thirty people there?—I have said there were.

6549. At this meeting this council was elected, and you were elected chairman?—Yes, it was proposed that I should take the chair.

6550. Was the council elected?—Yes; it was proposed that four of the council should be appointed to draw up by-laws and rules and regulations.

6551. Had you ever any meeting of more than thirty people the whole time?—No.

6552. Had you ever any other meeting called by advertisement after this?—Yes.

6553. At what date?—There was one on October the 29th. This was advertised in the *Times*. I know there were many others, but they have not been preserved.

6554. There is a reference here to an adjournment to November the 5th; did that meeting take place on November the 5th, at your rooms?—The minutes are not in order; I do not see any minutes of the November meeting.

6555. Can you remember whether anybody came?—No.

6556. You do not find any minute?—No.

6557. Can you tell the committee, from recollection, whether any persons came in pursuance of that advertisement?—I have no doubt there was a meeting, because I see a certain committee was ordered to produce by-laws and regulations, which were duly produced at the meeting.

6558. On that date?—I am not prepared to say; they were duly prepared and published and printed.

6559. This council having been elected by a meeting of thirty, had you ever any more constituents of this association than those?—No; I think people were about as lukewarm on the subject as they well could be.

6560. I see any person upon the payment of an annual minimum sum of 2s. 6d. becomes entitled to all the advantages and privileges that this association can afford; how many paid the minimum sum of 2s. 6d.?—I cannot tell you,

6561. Was there one minimum sum of 2s. 6d. paid?—Yes.

6562. Was there a banker?—Yes.

6563. The London and Westminster Bank?—Yes.

6564. And George Wells, I see, is the treasurer?—Yes.

6565. Were there any funds at all collected?—Yes; I believe the treasurer was in possession of some money; I find on the 7th of January, 1851, after the association had been in existence some months, the balance of cash in the hands of the treasurer was £2. 6s. 7d.

6566. Is that made up of minima sums of 2s. 6d. each from the public, and sums subscribed among yourselves?—I think very few subscribed more than 2s. 6d.

6567. Did not the council give more than 2s. 6d. each?—I think not many of them.

6568. Did they all subscribe 2s. 6d. a piece?—That I am not able to say; I hope they did.

6569. But you do not know?—No.

6570. There may be several of the council who by non-subscription of the minimum sum of 2s. 6d. did not become entitled to the privileges of the association?—If more had become entitled to the advantages of the association, I am quite convinced it would have been the best half-crown they had ever expended; many men of great intellect did think so, and among the rest was a man who, perhaps, has turned his attention to this important subject of the improvement of the sanitary condition of London as much as any man.

6571. Who is that?—Mr. John Martin, the artist.

6572. Did he subscribe?—If he did not, he told me he would.

6573. I see the treasurer reported the total receipts were £6. 6s. 7d.?—Yes.

6574. Did you ever get more than £6. 6s. 7d.?—I am not aware.

6575. Have you your banker's book here?—There has been no necessity for opening an account at the banker's.

6576. Did you ever get any more?—I am quite unable to say. I am not aware what the state of the financial matters of the concern is in any way.

6577. The meetings were held in your room?—They were.

6578. I suppose the association was not charged any rent?—No; it was the first thing I told them. I told them that till they had wings to fly with, as far as a floor in my house went, it was at their service without any charge.

6579. When was it you found the public did not think much about it, and you turned your attention to taking care of yourselves? did you come to any resolution about that?—I have always thought so; that was my opinion.

6580. Will you give me the minutes of the meeting preceding the representation which you made to Lord John Russell, suggesting the kind of bill which you thought he should bring in upon the water question; was that the combined act of the council?—No.

6581. Whose suggestion was it?—I believe they have recorded upon their minutes that they wished me to do it. I see there are the minutes of November 5, which you asked me for just now.

6582. I will not go back to them; I was asking you about the meeting preceding the representation that was made to Lord John Russell. Who drew up the memorial to Lord John Russell?—It is in the shape of a letter.

6583. Who drew it up?—I did; it is written as chairman of the association.

6584. Is that the composition of the council?—No; it is my own.

6585. Will you tell me what was the meeting at which it was arranged that you should do that; had Mr. Tabberner any hand in it?—He used to come down from time to time, and very likely he made some suggestions.

6586. Whose composition is it?—I think that letter was my own writing, as far as my memory serves me.

6587. Will you turn to the meeting preceding that?—Here is a meeting on December 17, 1850.

6588. Is there any record of it there?—I do not see it; here is a resolution, that all matters relating to water supply, and more especially that which Mr. George Rennie has lately published, should be taken cognizance of by the association.

6589. Is there a resolution or direction of any meeting suggesting to you to write this letter to Lord John Russell, or to Lord Seymour?—I do not see any minute made by the secretary upon these minutes; but I was requested by members of the council of the association to write that letter.

6590. In meeting assembled?—I have no doubt it was in meeting assembled.

6591. Have you any minute at all of it?—I do not see it on December 17.

6592. Is there any minute of your having done it at the next meeting?—I recollect this taking place:—"Mr. D. White proposed that the correspondence between the chairman with the First Lord of the Treasury of the 19th of December, 1850; with the Secretary of State of the 2nd of January, 1851; with the First Commissioner of Woods and Forests of the 30th of December, 1850; and with the Commissioners of Sewers of the 2nd of January, 1851; and their answers to the same, be noticed on the minutes." Mr. George Shepherd seconded that, and it was put, and carried unanimously. I see I was in error in saying that the same letter was written in every instance; I remember now that a letter was written at a subsequent period which was not identically the same letter; we had the pleasure of an interview with the secretary of the sewers commissioners, and after that interview we wrote that letter at the secretary's suggestion.

6593. Who is the secretary?—Mr. Woolrych.

6594. Did Mr. Woolrych suggest to you and to other gentlemen to write this letter?—He did; but I am sorry to have misled the committee by saying that those letters to all the parties were alike.

6595. By the COMMITTEE.] You say the letter to the Sewers Commission was different to the other letters, and it was written by you and Mr. Tabberner jointly, at the suggestion of the secretary of the Sewers Commission?—Yes, it was.

6596. Mr. JAMES.] Do you mean to represent that Mr. Woolrych, the secretary, suggested your writing the letter to Lord John Russell?—No; he suggested that we should put the views which we communicated to him in writing.

6597. He merely suggested that you should put your views into writing?—Yes.

6598. You made some verbal representation to Mr. Woolrych, and he suggested that you should put it into writing?—Yes.

6599. You cannot tell us whether there is any minute at all of any resolution in which it was suggested that you should write to Lord John Russell or to Lord Seymour?—No, I do not see it here.

6600. That letter was yours?—Yes, as chairman of the association.

6601. That letter suggests paid commissioners; you would have, I think, fifty-eight paid commissioners?—No; three paid commissioners.

6602. From each district?—No.

6603. How many paid commissioners would you have?—Three; the Government commissioner would be paid.

6604. How many commissioners were you to have?—Fifty-four.

6605. To manage the water and the sewers?—Yes.

6606. How were they to be appointed?—They were to be appointed by the ratepayers.

6607. Elected?—Yes.

6608. Annually?—No; triennially, I think.

6609. Who were to vote, the ratepayers or the water consumers?—The ratepayers; one-third of the representatives of the ratepayers were to retire every three years.

6610. I believe you proposed elective districts?—Yes.

6611. And only three of the commissioners to be paid?—Only three to be paid.

6612. Did you get any answer from Lord John Russell?—I got the official answer of an acknowledgment under the hands of the secretary.

6613. And there the matter ended?—It did.

6614. Is the association still going on?—Yes.

6615. Did that letter to Lord John Russell enclose a copy of this prospectus?—It did; it included the drawn map upon the prospectus.

6616. When did the association meet last?—On Tuesday, the 8th of July.

6617. This day week?—Yes.

6618. Has the balance in the hands of the treasurer increased?—The treasurer was not there.

6619. Were the funds there; the balance at the banker's?—There is no balance at the banker's; the balance is in the hands of the treasurer.

6620. You say you have no connection with the Metropolitan Parochial Association; have you anything to do with the expense of this

(*Continued at last page but one.*)

# Share List.

THE PRICES QUOTED ARE THOSE AT WHICH THE LAST SALES HAVE BEEN MADE.

*The Companies whose names are printed in italic type are incorporated by Act of Parliament.*

| Number of Shares issued. | Amount per Share | Name of Company. | Amount paid up per Share | Dividend per Cent. per Ann. | Price. |
|---|---|---|---|---|---|
| | £ | **ENGLAND.** | £ s. d | £ s. d | £ s. d |
| | | Aberdare | | | |
| | | Aberystwith | | | |
| | | Abingdon | | | |
| | | *Accrington* £7000 | | 5 0 0 | |
| | | Albrighton | | | |
| | | Alcester | | | |
| | | Alford, Lincolnsh. | | | |
| | | Alfreton | | | |
| | | Aluwick | | | |
| | | Alston Moor | | | |
| 250 | 10 | Alton | 10 0 0 | 5 0 0 | 10 0 0 |
| 800 | 5 | Altrincham | 5 0 0 | 4 0 0 | |
| | | Amlwch | | | |
| 160 | 10 | Ampthill | 10 0 0 | 5 0 0 | 10 0 0 |
| 350 | 10 | Andover | 10 0 0 | 6 0 0 | 11 0 0 |
| | | Appleby | | | |
| | | Arundel | | | |
| | | Ashbourn, Derby | | | |
| | | Ashburton | | | |
| | | Ashby-de-la-Zouch | | | |
| | | Ashford, Kent | | | |
| 1600 | 25 | *Ashton-under-Lyne* | 25 0 0 | 10 0 0 | 52 0 0 |
| | | Atherstone | | | |
| | | Axminster | | | |
| 225 | 20 | Aylesbury | 20 0 0 | 5 0 0 | 21 0 0 |
| | | Aylsham, Norfolk | | | |
| | | Bacup, Yorkshire | | | |
| | | Bakewell | | | |
| | | Baldock | | | |
| 140 | 25 | Banbury | 25 0 0 | 10 0 0 | 50 0 0 |
| | | Bangor | | | |
| 500 | 5 | Barking, Essex | 4 10 0 | 5 11 0 | 5 0 0 |
| 250 | 10 | Barnard Castle | 10 0 0 | 5 10 0 | 10 15 0 |
| | | Barnet | | | |
| | | *Barnsley* £6000 | | 7 10 0 | |
| 100 | 20 | Barnstaple | 20 0 0 | 7 10 0 | 25 0 0 |
| | | Barton | | | |
| 120 | 25 | Basingstoke | 25 0 0 | 8 0 0 | 28 0 0 |
| 2400 | 20 | *Bath* | 16 0 0 | 6 0 0 | 25 to 30 |
| | | Battle £2000 | | 6 0 0 | |
| 56 | 26½ | Bawtry | 26 10 0 | 5 0 0 | 25 0 0 |
| | | Beaumaris | | | |
| | | Beccles, Bungay, and Lowestoft | | | |
| | | Bedford | | | |
| | | Bedworth | | | |
| | | Belford | | | |
| | | Bedale, Yorkshire | | | |
| | | Belper | | | |
| | | Beminster | | | |
| | | Berkhempstead | | | |
| 700 | 5½ | Berwick-on-Tweed | 5 10 0 | 6 8 0 | 5 15 0 |
| | | Beverley | | | |
| | | Bewdley | | | |
| 280 | 10 | Bideford | 10 0 0 | 6 0 0 | 10 10 0 |
| | | Biggleswade | | | |
| 160 | 10 | Bicester | 10 0 0 | 5 0 0 | 10 0 0 |
| | | *Bilston* £15,100 | | 8 0 0 | |
| | | Billericay | | | |
| | | *Bingley* £7400 | | 4 0 0 | |
| | | *Birkenhead* £70,000 | 35 0 0 | 3 0 0 | 35 to 37 |
| 2400 | 50 | *Birmingham and Staffordshire* | 80 0 0 | 10 0 0 | 93 to 94 |
| | 25 | *Ditto*, new shares | 7 10 0 | 10 0 0 | 12 0 0 |
| 928 | 75 | *Birmingham* | 75 0 0 | 10 0 0 | 139 to 141 |
| | | Bishop's Auckland | | | |
| | | Bishop's Stortford | | | |
| | | *Blackburn* £30,000 | | 10 0 0 | |
| | | Blandford | | | |
| | | Blythe | | | |
| | | Bodmin | | | |
| | | Bognor | | | |
| | | *Bolton* £38,582 | | 9 19 5 | |
| | | Boroughbridge | | | |
| | | *Boston* £8000 | | 10 0 0 | |
| 200 | 10 | Bourn | 10 0 0 | 5 0 0 | |
| | | Brackley | | | |
| | | Bradford, Wilts | | | |
| | | *Bradford, Yorksh.* £45,000 | | 9 10 0 | |
| | | Brampton, Cumb. | | | |
| | | Brandon, Suffolk | | | |
| | | Brecon | | | |
| | | Bridge-end, Glam. | | | |
| | | *Brierly Hill* | | | |
| 2250 | 20 | *Brighton* | 20 0 0 | 5 0 0 | 14 to 15 |
| 1125 | 20 | „ new shares | 16 0 0 | 5 0 0 | |
| | | *Brighton and Hove* £50,376 | | | |
| 4250 | 20 | *Bristol* | 20 0 0 | 9 0 0 | 37 0 0 |
| 1725 | 25 | *Bristol and Clifton* | 25 0 0 | 6 0 0 | 25 0 0 |
| | | Brixham | | | |
| | | Braintree | | | |
| 750 | 50 | *Brentford* | 50 0 0 | 6 0 0 | 44 to 46 |
| 800 | 25 | „ new shares | 11 0 0 | 6 0 0 | 11 0 0 |
| | | Brentwood | | | |
| | | *Bridgwater* £6000 | | 5 0 0 | |
| 400 | 10 | Bridlington | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Bridport | | | |
| | | Brigg | | | |
| | | Broadstairs | | | |
| 100 | 50 | Bromley, Kent | 50 0 0 | 6 0 0 | 52 10 0 |
| | | Bromsgrove | | | |
| | | Broughton | | | |
| 120 | 10 | Bruton | 10 0 0 | 4 0 0 | 8 0 0 |
| 100 | 25 | Buckingham | 25 0 0 | 5 0 0 | 25 0 0 |
| | | Bungay (see Beccles) | | | |
| | | Burford | | | |
| | | *Burnley* £19,946 | | 4 10 2 | |
| | | Bursalem | | | |
| | | Burton-on-Trent | | | |
| | | *Bury, Lanc.* £6570 | | | |
| | | *Bury St. Edmund's* | | 5 0 0 | |
| | | Buxton | | | |
| | | Callington | | | |
| | | Calne, Wilts | | | |
| | | Camborne | | | |
| | | *Cambridge* £34,560 | | 9 0 0 | |
| | | *Canterbury* | 50 0 0 | 6 0 0 | |
| 240 | 50 | *Ditto*, second issue | 25 0 0 | 6 0 0 | 57 to 58 |
| 240 | 25 | *Cardiff* £12,000 | | 7 10 0 | 28 to 29 |
| | | Carmarthen | | | |
| | | Castleford | | | |
| | | Chapel on the Frith | | | |
| | | Chard | | | |
| | | *Chatham* (see Roch. | | | |
| | | Chatteris | | | |
| | | Cheadle | | | |
| | | Chelmsford | | | |
| | | *Cheltenham* £18,732 | | 8 10 0 | |
| | | Chepstow | | | |
| | | Chertsey | | | |
| | | Chesham, Bucks | 10 0 0 | | |
| 230 | 10 | Chester | | | |
| | | Chester-le-Street | | | |
| | | *Chesterfield* £13,123 | | 4 17 6 | |
| | | Chichester | 25 0 0 | 6 0 0 | 30 0 0 |
| 240 | 25 | Chippenham | | | |
| | | Chipping Norton | | | |
| | | Chirk | | | |
| | | Chorley | | | |
| | | Chudleigh | | | |
| | | Cirencester | | | |
| | | *Clifton (Bristol and* | | | |
| | | Cleckheaton, York. | | | |
| | | Clitheroe | | | |
| | | Cockermouth | | | |
| | | Colchester | | | |
| | | Collumpton | | | |
| | | Colne, Lancashire | | | |
| | | Coleford, Gloucest. | | | |
| | | Coggeshall | | | |
| | | *Congleton* £5000 | | 5 0 0 | |
| | | Cookstown | | | |
| | | Cowbridge | | | |
| | | Corsham | | | |
| 800 | 25 | *Coventry* | 25 0 0 | 6 0 0 | 20 0 0 |
| | | Cowes | | | |
| | | Crewkerne | | | |
| | | *Croydon* ... £20,000 | | 5 0 0 | |
| | | Cranbrook ... £1900 | | 5 0 0 | |
| | | Crayford | | | |
| | | Crediton | | | |
| | | Crewe, Cheshire | | | |
| | | Cricklade | | | |
| | | Darlaston | | | |
| | | *Darlington* | | | |
| 250 | 20 | Dartford | 20 0 0 | 7 10 0 | 27 0 0 |
| | | Dartmouth | | | |
| 125 | 20 | Daventry | 20 0 0 | 6 0 0 | 21 8 0 |
| | | Dawley, Shrop. | | | |
| | | Dawlish | | | |
| | | Dedington | | | |
| 500 | 6 | Denbigh | 6 0 0 | 5 0 0 | 6 0 0 |
| 820 | 10 | Deptford | 10 0 0 | 5 0 0 | 4 10 0 |
| 325 | 50 | *Derby* | 50 0 0 | 10 0 0 | |
| 90 | 20 | Dereham (East) | 20 0 0 | 4 10 0 | |
| 1000 | 5 | *Dewsbury* | 5 0 0 | 10 0 0 | 8 12 6 |
| | | Devizes | | | |
| 4000 | 5 | *Devonport* | 5 0 0 | 6 0 0 | 6 5 0 |
| | | Doncaster | | | |
| 280 | 25 | Dorchester | 25 0 0 | 5 0 0 | 30 0 0 |
| 120 | 25 | Dorking | 20 10 0 | 5 0 0 | 21 10 0 |
| | | Douglas, Isle of M. | | | |
| 209 | 56½ | *Dover* | 56 10 0 | 4 15 4 | 55 0 0 |
| | | Downham | | | |
| | | Driffield | | | |
| | | Droitwich | | | |
| 600 | 20 | *Dudley* | 20 0 0 | 4 0 0 | 15 to 16 |
| | | Droylsden | | | |
| | | Dunmow | | | |
| | | Dunstable | | | |
| | | Durham | | | |
| 276 | 9 | Dursley, Gloster | 9 0 0 | 5 10 0 | 8 0 0 |
| | | Eastbourne | | | |
| | | East Grinstead | | | |
| | | Elland | | | |
| | | Ellesmere | | | |
| | | Enfield | | | |
| 300 | 19 | Epsom and Ewell | 19 0 0 | | |
| | | Evesham | | | |
| | | *Exeter* £40,000 | | 10 0 0 | |
| | | Exmouth | | | |
| | | Eye, Suffolk | | | |
| 64 | 25 | Fakenham | 25 0 0 | 5 0 0 | 25 0 0 |
| | | Falmouth | | | |
| | | Fareham | | | |
| 120 | 25 | Farnham | 25 0 0 | 10 0 0 | 42 0 0 |
| | | Farringdon | | | |
| | | Faversham | | | |
| | | Ferrybridge | | | |
| | | Fleetwood | | | |
| | | Folkestone | | | |
| | | Fowey | | | |
| 240 | 5 | Framlingham | 5 0 0 | 5 0 0 | 5 0 0 |
| | | Frome | | | |
| | | Garstang | | | |
| | | Gillingham, Dorset | | | |
| | | Glastonbury | | | |
| | | *Glossop* ... £10,000 | | 9 0 0 | |
| 1000 | 25 | *Gloucester* | 25 0 0 | 7 10 0 | 28 0 0 |
| | | Gomersal | | | |
| | | Godalming | | | |
| | | Gosport | | | |
| 1000 | 20 | Grantham | | | |
| 1000 | 10 | Gravesend | 20 0 0 | 5 0 0 | 21 0 0 |
| | 25 | *Great Grimsby* | 8 0 0 | 8 0 0 | 10½ to 11 |
| | | Guildford | 25 0 0 | 4 0 0 | 20 0 0 |
| | | Guisborough | | | |
| | | Hadleigh | | | |
| 300 | 6 | Hales Owen | | | |
| | | Halesworth | 6 0 0 | 7 10 0 | 5 10 0 |
| | | *Halifax* £15,000 | | 10 0 0 | |
| | | Halstead | | | |
| | | Hampton Court | | | |
| | | *Harrogate* £10,000 | | 5 0 0 | |
| | | *Hartlepool* £15,137 | | 7 10 0 | |
| 330 | 50 | Haslingden, Lanash | | | |
| | | Hastings and St. L. | 50 0 0 | 6 0 0 | 60 0 0 |
| | | Haverfordwest | | | |
| | | Haverhill | | | |
| | | Haworth, Yorks. | | | |
| | | Hayle | | | |
| | | Helstone | | | |
| 300 | 10 | Hemel Hempstead | | | |
| | | Henley-on-Thams. | 10 0 0 | | |
| | | *Hereford* £5300 | | 4 0 0 | |
| 270 | 10 | Herne Bay | | | |
| | | Hexham | 10 0 0 | 7 0 0 | 12 0 0 |
| | | *Heywood* £10,000 | | 5 0 0 | |
| 230 | 10 | Highworth (Wilts) | | | |
| | | Hinckley | 10 0 0 | 5 0 0 | 7 0 0 |
| | | Hindley, Lancash. | | | |
| | | Hitchen | | | |
| | | Hythe | | | |
| | | Hoddesden | | | |
| | | Holbeach | | | |
| | | *Holmfirth* £8880 | | 3 10 0 | |
| | | Holyhead | | | |
| | | Holywell (see British Provincial) | | | |
| | | Honiton | | | |
| 10 | | Horncastle | | | |
| | | Houghton-le-Sprg. | 10 0 0 | 8 0 0 | |
| | | Horsham | | | |
| | | Howden | | | |
| | | Hull, Sculcoats (see British Provin.) | | | |
| | | *Hull*, £11,712. 10s. | | 5 0 0 | |
| | | Hunmanby | | | |
| 210 | 10 | Hungerford | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Huddersfield | | | |
| 520 | 5 | High Wycombe | 5 0 0 | 6 0 0 | 5 0 0 |
| | | Ilminster | | | |
| | | Ilford | | | |
| | | Ilfracombe | | | |
| | | Ironbridge | | | |
| 1400 | 10 | *Ipswich* | 10 0 0 | 8 0 0 | 15 0 0 |
| 1400 | 10 | „ new shares | 7 10 0 | 8 0 0 | |
| 800 | 25 | *Isle of Thanet* (Ramsgate&Mar.) | 20 0 0 | 5 0 0 | 20 to 21 |
| | | *Kendal* £9100 | | 8 15 0 | |
| | | Kenilworth | | | |
| | | Keswick | | | |
| 100 | 25 | Kettering | 25 0 0 | 5 0 0 | 25 0 0 |
| | | *Kiddermins.* £10000 | | 5 0 0 | |
| | | King's Langley | | | |
| | | Kington, Hereford | | | |
| | | Kirkby Lonsdale | | | |
| | | Kirkham, Lanc. | | | |
| | | Knutsford | | | |
| | | Lancaster | | | |
| | | *Llanelly* £3300 | | 5 0 0 | |
| | | Llandovery | | | |
| | | *Leamington Priors* £22,500 | | 6 0 0 | |
| | | Leatherhead | | | |
| | | Ledbury | | | |
| | | *Leeds Old Comp.* old stk., £60,300 | | 10 0 0 | |
| | | new „ £23,775 | | 6 0 0 | |
| | | *Leeds New* £60,000 | | 10 0 0 | |
| | | Leek | | | |
| | | *Leicester* ... £36,230 | | 7 0 0 | |
| | | Leigh | | | |
| 125 | 20 | Leighton Buzzard | 20 0 | 5 0 0 | |
| | | Leominster | | | |
| | | Leyburn, Yorksh. | | | |
| | | Liskeard | | | |
| 330 | 25 | Lewes | 25 0 0 | 5 0 0 | 23 0 0 |
| | | *Lincoln* £8000 | | 10 0 0 | |
| | | Leyland, Lancash. | | | |
| | | Littlehampton | | | |
| 250 | 20 | Lichfield | 20 0 0 | 10 0 0 | 30 0 0 |
| | | *Liverpool United* | 100 0 0 | 9 0 0 | 186 to 188 |
| | | „ ¼ sh. | 25 0 0 | 9 0 0 | 46½ to 47 |
| | | Langport | | | |
| | | London Comps.— | | | |
| 5000 | 40 | *British* | 18 0 0 | 1 18 10 | 12 to 13 |
| | | „ debentures £16,300 | | 4 0 0 | |
| 5000 | 20 | „ Provincial—(Holywell, Hull, Norwich, Potteries, Trowbridge) | 20 0 0 | 7 0 0 | 17 to 19 |
| | 20 | „ Prov., new | 10 0 0 | 7 0 0 | 7 to 9 |
| | 25 | *Commercial* | 25 0 0 | 6 0 0 | 22 to 24 |
| | 25 | „ new shares | 15 0 0 | 6 0 0 | part old is |
| | 25 | „ „ | 2 10 0 | 6 0 0 | part old is |
| 12,000 | 50 | *Chartered* | 50 0 0 | 6 0 0 | 44 to 45 |
| 6000 | 50 | „ new shares | 10 0 0 | 6 0 0 | 8 to 9 |
| 2000 | 150 | *City of London* | 150 0 0 | 4 0 0 | 120 to 125 |
| 4000 | 50 | *Equitable* | 50 0 0 | 2 10 0 | 26 to 27 |
| | | „ debentures £46,000 | | | |
| 10,000 | 20 | European—(Amiens, Boulogne, Caen, Havre, Nantes, and Rouen) | 20 0 0 | 5 0 0 | 12 to 14 |
| 2000 | 20 | „ do. new | 7 0 0 | 5 0 0 | 5 to 7 |

| Number of Shares issued. | Amount per Shar | Name of Company. | Amount paid up per Share | Dividend per Cent. per Ann. | Price. |
|---|---|---|---|---|---|
| | £ | | £ s. d | £ s. d | £ s. d |
| 15,000 | 10 | *Gt.Cntl.Consumers* | 10 0 0 | 5 0 0 | |
| 8000 | 50 | *Impl.Continental*—(Amsterdam, Aix-la-Chapelle Antwerp, Berlin, Bordeaux, Brussels, Cologne, Frankft., Ghent, Haarlem Hanover, Lille, Marseilles, Rotterdam, Toulouse, Vienna) | 42 0 0 | 5 19 0 | 41 to 43 |
| 7000 | 50 | „ new shares | 41 0 0 | 9 15 0 | 60 to 65 |
| | 50 | „ third issue | 42 10 0 | 8 16 0 | 55 to 60 |
| 10,000 | 50 | *Imperial* | 50 0 0 | 6 0 0 | 68 to 70 |
| 3000 | 50 | „ new shares | 40 0 0 | 6 0 0 | 55 to 57 |
| | | „ debentures £50,500 | | | |
| 4000 | 40 | *Independent* | 40 0 0 | 6 0 0 | 46 to 47 |
| 3000 | 50 | *London* | 50 0 0 | | 7 to 9 |
| 6000 | 25 | „ preference | 10 0 0 | 6 0 0 | 10 0 0 |
| 3000 | 50 | „ 2nd do. | 50 0 0 | | 15 to 18 |
| 9000 | 50 | *Phœnix* | 49 0 0 | 4 10 0 | 27 to 28 |
| 1000 | 100 | *Ratcliff* | 90 0 0 | 5 0 0 | 60 to 65 |
| 4000 | 25 | *South Metrop.* | 25 0 0 | 6 0 0 | 22 to 23 |
| 9000 | 50 | Surrey Consumers' | | | |
| | | United General—(Cork, Dublin, Limerick) | 50 0 0 | 2 0 0 | 16 to 18 |
| 12,500 | 20 | Western | 19 0 0 | | 7 0 0 |
| | | Lostwithiel | | | |
| | | Loughborough | | | |
| 240 | 25 | *Louth* | 25 0 0 | 6 0 0 | 26 10 0 |
| | | Lowestoft (see Bec. | | | |
| 611 | 5 | Ludlow Union | 5 0 0 | 6 0 0 | 5 0 0 |
| | | Luton | | | |
| | | Lutterworth | | | |
| | | Lyme Regis | | | |
| | | Lymington | | | |
| | | Malmesbury | | | |
| | | *Macclesfield* 32,000 | | 3 15 0 | |
| | | Maidenhead | | | |
| 300 | 50 | *Maidstone* | 50 0 0 | 10 0 0 | 90 0 0 |
| | | Maldon | | | |
| | | Marlborough | | | |
| | | Malton (New) | | | |
| | | Malvern | | | |
| | | Manningtree | | | |
| | | *Mansfield* £5000 | | 10 0 0 | |
| | | March | | | |
| | | *Margate* (see I. of T. | | | |
| | | Market Deeping | | | |
| | | Market Drayton | | | |
| 132 | 25 | Market Harboro' | 25 0 0 | 6 0 0 | 30 0 0 |
| | | Market Raisin | | | |
| | | Market Weighton | | | |
| | | Marlow | | | |
| 370 | 10 | Maryport | 10 0 0 | 6 0 0 | 12 0 0 |
| | | Melksham | | | |
| | | Melton Mowbray | | | |
| | | Merthyr Tydvil | | | |
| | | Mere | | | |
| | | *Middleton* £9032 | | 5 0 0 | |
| | | Midsummer Norton | | | |
| | | Middlesboro' | | | |
| | | Mildenhall | | | |
| | | Mitcham | | | |
| | | Mold | | | |
| 700 | 10 | Monmouth | 10 0 0 | 5 0 0 | |
| | | Monk Wearmouth | | | |
| | | Moreton in Marsh | | | |
| | | Morley | | | |
| | | Mottram | | | |
| | | Nantwich | | | |
| | | Neath | | | |
| | | Needham Market | | | |
| | | *Newark* £5000 | | 10 0 0 | |
| 250 | 20 | Newbury | 20 0 0 | 5 0 0 | 20 0 0 |
| 13,000 | 5 | Newcastle & Gateshead Union | 5 0 0 | 8 0 0 | 8 0 0 |
| | | *Newcastle-under-Lyme* £6200 | | 4 0 0 | |
| 600 | 5 | Newmarket | 5 0 0 | 6 0 0 | 5 0 0 |
| | | Newnham, Glost. | | | |
| | | Newent | | | |
| | | *New Mills* £2115 | | 8 0 0 | |
| | | *Newport, M.* £11720 | | | |
| 320 | 50 | *Newport, Isle of W.* | 38 0 0 | 4 0 0 | 19 to 20 |
| | | Newport Pagnell | | | |
| | | Newport, Salop | | | |
| | | Newton Abbot | | | |
| | | Newton, Lanc. | | | |
| | | Northallerton | | | |
| | | North Walsham | | | |
| 542 | 20 | *Northampton* | 18 0 0 | 10 0 8 | 27 0 0 |
| | | Northfleet | | | |
| | | Northwich | | | |
| | | *Norwich* (see British Pro. £40,000 | | 7 0 0 | |
| 900 | 50 | *Nottingham* | 50 0 0 | 10 0 0 | |
| 900 | 50 | New shares | | 10 0 0 | |
| | | Nuncaton | | | |
| | | Oakham | | | |
| | | Oakhampton | | | |
| 200 | 10 | Odiham, Hants | 10 0 0 | 3 10 0 | 10 0 0 |
| | | *Oldham* | | | |
| | | Olney | | | |
| | | Ongar | | | |
| | | Ormskirk | | | |
| | | Otley, Yorkshire | | | |
| | | Oundle | | | |
| 150 | 120 | *Oxford* | 120 | 8 0 0 | 260 |
| | | *Over Darwen* £8000 | | 5 0 0 | |
| | | Padstow | | | |
| | | Patchy Bridge, Yrk. | | | |
| 250 | 20 | Penrith | 15 0 0 | 6 10 0 | 21 0 0 |
| | | Penryn | | | |
| | | Penzance | | | |
| 200 | 10 | Petworth | 10 0 0 | 8 0 0 | 12 0 0 |
| | | Petersfield | | | |
| | | Pickering | | | |
| 3000 | 10 | *Plymouth* | 10 0 0 | 6 0 0 | 11 0 0 |
| | | Pocklington | | | |
| | | Pontefract | | | |
| | | *Pontypridd* | | | |
| 400 | 10 | Poole | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Port Madoc | | | |
| 600 | 50 | *Portsea Island* | 53 0 0 | 5 0 0 | 45 to 47 |
| 400 | 10 | Prescott | 9 0 0 | 4 13 4 | 7 0 0 |
| | | *Preston* £52,500 | | 10 0 0 | |
| | | Pwllheli | | | |
| | | *Pudsey* £12,000 | | 5 0 0 | |
| | | *Radcliff and Pilkington* £9000 | | 4 12 10 | |
| | | Ramsay, I. of Man | | | |
| | | *Ramsgate* (see Isle of Thanet) | | | |
| | | Ravenglass | | | |
| 1000 | 10 | *Reading* | 10 0 0 | 3 0 0 | 7 0 0 |
| 500 | 20 | *Reading Union* | 20 0 0 | 6 0 0 | 17 0 0 |
| | | Redditch | | | |
| | | Redruth | | | |
| | | Reigate | | | |
| | | Retford (East) | | | |
| | | Rhyl | | | |
| | | Richmond (Surrey) | | | |
| | | Ripon | | | |
| | | *Rochester and Chatham* £20,000 | | 6 0 0 | |
| | | Rochford | | | |
| | | Rockingham | | | |
| | | Romford | | | |
| | | Ross | | | |
| 215 | 25 | *Rotherham* | 25 0 0 | 6 0 0 | 40 10 0 |
| | | Royston | | | |
| | | Ruabon | | | |
| | | Rugby | | | |
| | | Rugeley | | | |
| | | *Runcorn* £11,000 | | 7 10 0 | |
| | | Ruthin | | | |
| 500 | 10 | Ryde | 10 0 0 | 6 0 0 | 12 0 0 |
| | | Rye | | | |
| | | Romsey | | | |
| | | Saddleworth | | | |
| 225 | 20 | Saffron Walden | 20 0 0 | 3 15 0 | 19 0 0 |
| | | St. Austel | | | |
| | | St. Asaph | | | |
| | | St. Colomb | | | |
| | | *St. Helen's* £7500 | | 7 10 0 | |
| | | St. Helier's (Jersey) | | | |
| | | St. Ives, Hunting. | | | |
| | | St. Ives, Cornwall | | | |
| 250 | 10 | St. Neot's | 10 0 0 | 8 0 0 | 12 0 0 |
| | | St. Peter's Port, (Guernsey) | | | |
| 320 | 25 | Salisbury | 25 0 0 | 6 0 0 | 28 to 30 |
| | | Sandbach | | | |
| 140 | 10 | Saxmundham | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Scarborough | | | |
| | | Seaham Harbour | | | |
| | | Sedburgh | | | |
| | | Selby | | | |
| | | Settle | | | |
| 290 | 10 | Sevenoaks | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Shaftesbury | | | |
| 5400 | 25 | *Sheffield United* | 24 0 0 | 8 6 8 | 35 0 0 |
| | | Shelton, Potteries (see Brit. Prov.) | | | |
| | | Shepton Mallet | | | |
| | | Sherborne | | | |
| 2914 | 5 | Shields (Tynemth. | 5 0 0 | 3 0 0 | 5 0 0 |
| | | Shields (South) | | | |
| | | Shiffnal, Salop | | | |
| 1000 | 5 | *Shipley* | 5 0 0 | 6 0 0 | 5 12 6 |
| | | Shipston-on-Stour | | | |
| | | Shoreham | | | |
| | | *Shrewsbury* £10,000 | | 7 0 0 | |
| 400 | 10 | Skipton | 10 0 0 | 4 0 0 | 11 0 0 |
| 350 | 10 | Slough | 10 0 0 | | |
| | | Snaith | | | |
| | | Soham | | | |
| | | Southwold | | | |
| | | South Molton | | | |
| 1000 | 50 | *Southampton* | 32 0 0 | 5 0 0 | |
| | | Sowerby, Yorksh. | | | |
| | | Stretford | | | |
| | | Stokesly | | | |
| | | *Stafford* £10,000 | | 5 0 0 | |
| | | Staines and Egham | | | |
| | | *Staley Bdg.* £15,000 | | 10 0 0 | |
| | | *Stamford* £11,250 | | 3 0 0 | |
| | | *Stockton-on-Tees* £7980 | | 9 5 0 | |
| 840 | 9½ | Stockton, New | 9 10 0 | 9 0 0 | 8 0 0 |
| 960 | 10 | Stoke-upon-Trent | 10 0 0 | 5 10 0 | 10 0 0 |
| 500 | 10 | „ new shares | 4 0 0 | 5 10 0 | 10 0 0 |
| | | Stone, Stafford | | | |
| | | Stoney Stratford | | | |
| | | Stourbridge | | | |
| | | Stowmarket | | | |
| 150 | 20 | Stratford-on-Avon | 20 0 0 | 7 10 0 | 30 0 0 |
| | | Stroud | | | |
| 169 | 10 | Swaffham | 10 0 0 | 5 0 0 | 5 10 0 |
| | | *Swansea* £9000 | | | |
| | | Sudbury | | | |
| | | Sunderland, old | | | |
| 6100 | 5 | *Sunderland, new* | 5 0 0 | | |
| | | Sutton | | | |
| | | Swindon | | | |
| | | Sydenham | | | |
| 2800 | 5 | *Taunton* | 5 0 0 | None | 2 10 0 |
| | | Tadcaster | | | |
| | | Tamworth | | | |
| | | Tavistock | | | |
| | | Teignmouth | | | |
| | | Tenbury | | | |
| | | Tenby | | | |
| | | Tenterden £2000 | | 2 10 0 | |
| | | Tetbury, Gloster | | | |
| | | Tewkesbury | | | |
| | | Thame | | | |
| | | Thetford | | | |
| | | Thirsk | | | |
| | | Thornbury | | | |
| | | Thorne | | | |
| | | Tiverton | | | |
| 670 | 5 | Todmorden | 3 0 6 | | |
| | | Torquay | | | |
| | | Torrington, Devon | | | |
| | | Totnes | | | |
| | | Totnes and Bridgetown Consumers | | | |
| 4000 | 5 | Tottenham | 3 10 0 | 6 0 0 | 3 0 0 |
| | | Towcester | | | |
| 200 | 10 | Tring | 10 0 0 | 5 0 0 | 10 0 0 |
| | | Trowbridge (see British Provin.) | | | |
| 75 | 50 | Truro | 50 0 0 | 2 0 0 | |
| | | Tunbridge | | | |
| | | Tunbridge Wells | | | |
| | | Ulverston | | | |
| | | Uppingham | | | |
| 210 | 5 | Upton-on-Severn | 5 0 0 | 5 0 0 | 5 0 0 |
| | | Usk, Monmouth | | | |
| | | Uttoxeter | | | |
| | | Uxbridge | | | |
| 1000 | 25 | *Wakefield*, old capl | 25 0 0 | 6 0 0 | 25 0 0 |
| 1600 | 5 | „ new „ | 5 0 0 | 6 0 0 | 5 0 0 |
| 300 | 10 | Wallingford | 10 0 0 | 5 0 0 | 8 0 0 |
| | | Wandsworth | | | |
| | | Wantage | | | |
| | | *Warrington* £23304 | | 10 0 0 | |
| 100 | 10 | Wareham | 10 0 0 | 3 10 0 | 8 0 0 |
| 120 | 25 | Warminster | 25 0 0 | 5 0 0 | 27 0 0 |
| | | Warth | | | |
| | | *Warwick* £15,000 | | 6 0 0 | |
| | | Watford | | | |
| | | Welchpool, Montgy. | | | |
| | | Wellingborough | | | |
| | | Wellington, Salop | | | |
| | | Wellington, Smrst. | | | |
| | | *Wells, Smrst.* £5000 | | 7 10 0 | |
| | | Westbury | | | |
| | | Weston-sup.-Mare | | | |
| 2000 | 5 | West Ham | 5 0 0 | 6 0 0 | 5 0 0 |
| | | Whitby | | | |
| | | Whitehaven | | | |
| | | Whitstable | | | |
| | | Whittlesea | | | |
| | | *Wigan* £10,160 | | 10 0 0 | |
| | | Willenhall | | | |
| | | Winchelsea | | | |
| | | Winslow | | | |
| 240 | 10 | Wimborne Minster | 10 0 0 | | |
| | | Wincanton | | | |
| 350 | 50 | Winchester | 50 0 0 | 6 0 0 | |
| 900 | 12½ | Windsor | 12 10 0 | 10 0 0 | 23 0 0 |
| | | Witham | | | |
| | | Witney | | | |
| 4448 | 10 | *Wolverhampton* | 10 0 0 | 7 0 0 | 15 0 0 |
| | | Woburn | | | |
| 210 | 10 | Wokingham | 10 0 0 | | 10 0 0 |
| | | Woodbridge | | | |
| | | Wooler | | | |
| | | Wotton-un.-Edge | | | |
| | | *Worcester* £29,000 | | 8 0 0 | |
| | | Workington | | | |
| | | Worksop and Radford | | | |
| | | Wirksworth | | | |
| | | Worthing | | | |
| | | Wrexham | | | |
| | | Woolwich | | | |
| | | Woolwich Consms. | | | |
| | | Woolwich (North) | | | |
| | | Wymondham | | | |
| | | Yarm | | | |
| 795 | 20 | Yarmouth | 20 0 0 | | 15½ to 16½ |
| | | Yeadon, near Leeds | | | |
| | | Yeovil | | | |
| | | *York Untd.* £35,000 | | 7 0 0 | |
| | | **SCOTLAND.** | | | |
| | 5 | Aberdeen | 3 0 0 | | 3 16 6 |
| | | Airdrie | | | |
| | | Alloa | | | |
| | | Annan | | | |
| | | Anstruther | | | |
| | | Ardrossan | | | |
| 550 | 20 | Arbroath | 20 0 0 | 7 10 0 | 27 10 0 |
| | | Auchterarder | | | |
| 750 | 2 | Auchtermuchty | 2 0 0 | 6 0 0 | 2 10 0 |
| | | Ayr, old | | | |
| | | Ditto, new | | | |
| | | Banff | | | |
| | | Barrhead | | | |
| | | Bathgate | | | |
| | | Beith | | | |
| | | Bervie | | | |
| | | Biggar | | | |
| | | Blairgowrie | | | |
| 400 | 6 | Borrowstowness | 6 0 0 | 5 0 0 | 8 0 0 |
| | | Brechin | | | |
| | | Bridge of Allan | | | |
| | 2 | Broughty Ferry | 2 0 0 | 5 0 0 | 2 0 0 |
| | | Burntisland | | | |
| | | Calien | | | |
| | | Campbelton | | | |
| | | Clackmannan | | | |
| | | Coatbridge | | | |
| | | Coldstream | | | |
| | | Collinsburgh | | | |
| | | Crieff | | | |
| | | Crail, Fife | | | |
| | | Cumbernauld | | | |
| | | Cumnock | | | |
| 600 | 5 | Cupar Angus | 5 0 0 | 6 0 0 | 5 10 0 |
| 250 | 10 | Cupar Fife | 10 0 0 | 7 10 0 | 14 0 0 |
| | | Dalkeith | | | |
| | | Dingwall | | | |
| | | Dornoch | | | |
| | | Douglas | | | |
| | | Dumbarton | | | |
| 400 | 20 | Dumfries | 14 0 0 | 5 0 0 | 20 0 0 |
| | | Dunbar | | | |
| | | Dunblane | | | |
| | 23½ | *Dundee*, old £29,687 | 23 15 0 | 8 8 0 | 30 10 0 |

| Number of Shares issued. | Amount per Share | Name of Company. | Amount paid up per Share | Dividend per Cent. per Ann. | Price. |
|---|---|---|---|---|---|
| | £ | | £ s. d | £ s. d | £ s. d |
| | 5 | *Dundee*, nw £33,851 | 5 0 0 | 2 10 0 | 4 0 0 |
| 860 | 10 | Dunfermline | 10 0 0 | 6 0 0 | 12 12 0 |
| | | Dunkeld | | | |
| | | Dunse | | | |
| | | Dysart | | | |
| 6000 | 25 | *Edinburgh Gas Co.* | 25 0 0 | 10 0 0 | 52 10 0 |
| | 25 | „ *and Leith Co.* £98,640 | 18 0 0 | 7 10 0 | 27 13 6 |
| | | Elie | | | |
| | | Elgin | | | |
| | | Falkirk, old | | | |
| | | „ new | | | |
| | | Falkland | | | |
| | | Ferry Port on Craig | | | |
| | | Fochabers | | | |
| | | Forfar | | | |
| | | Fort William | | | |
| | | Fraserburgh | | | |
| | | Galashiels | | | |
| | | Garlieston | | | |
| | | Gatehouse n. Fleet | | | |
| | | Girvan | | | |
| | 25 | *Glasgow* £122,500 | 25 0 0 | 10 0 0 | 50 0 0 |
| 15000 | 10 | *Glasgow City and Suburban* | 9 0 0 | 7 15 0 | 15 12 0 |
| | | Grangemouth | | | |
| | | Grahamston | | | |
| | | Haddington | | | |
| | | *Hamilton* £7500 | | 8 0 0 | |
| | | Hawick | | | |
| | | Helensburgh | | | |
| | | Huntly | | | |
| | | Inverary | | | |
| 400 | 1 | Inverkeithing | 1 0 0 | 5 0 0 | 1 0 0 |
| 1200 | 10 | *Inverness Gas and Water* | 10 0 0 | 5 10 0 | 15 0 0 |
| 2400 | 5 | „ new shares | 1 5 0 | 5 10 0 | 2 5 0 |
| | | Irvine | | | |
| | | Jedburgh | | | |
| | | Johnstone, near Paisley | | | |
| | | Keith | | | |
| | | Kelso | | | |
| | | Kilmarnock | | | |
| | | Kincardine | | | |
| | | Kinghorn | | | |
| | | Kingskittle, Fife | | | |
| | | Kinross | | | |
| | | Kirkaldy | | | |
| 320 | 5 | Kirkcudbright | 5 0 0 | 5 0 0 | 5 0 0 |
| 1000 | 3 | Kirkintulloch, near Glasgow | 3 0 0 | 5 0 0 | 3 0 0 |
| 227 | 5 | Kirkwall | 5 0 0 | 5 0 0 | 4 10 0 |
| 518 | 5 | Kirriemuir | 5 0 0 | 6 0 0 | |
| | | Lanark | | | |

| Number of Shares issued. | Amount per Share | Name of Company. | Amount paid up per Share | Dividend per Cent. per Ann. | Price. |
|---|---|---|---|---|---|
| | £ | | £ s. d | £ s. d | £ s. d |
| | | Largo, near Leven | | | |
| | | Largs | | | |
| | | Lasswade, n. Edin. | | | |
| | | Lauder | | | |
| | | Leith | | | |
| | | Leslie, Fife | | | |
| | | Lesmahago | | | |
| | | Leven | | | |
| | | Linlithgow | | | |
| | | Linton, n. Nobleh. | | | |
| | | Lochee, n. Dundee | | | |
| | | Lochgilphead | | | |
| | | Lochwinnock, near Paisley | | | |
| 1200 | 1 | Markinch | 1 0 0 | 7 10 0 | 1 5 0 |
| | | Mauchline | | | |
| | | Maxwell-town, n. Dumfries | | | |
| | | Maybole, Ayrshire | | | |
| | | Maryhill, near Glasgow | | | |
| | | Melrose | | | |
| 718 | 2 | Mid & East Calder | 2 0 0 | | 2 0 0 |
| 192 | 5 | Moffat | 5 0 0 | | |
| | 13½ | Montrose | 13 10 0 | 7 11 1 | |
| | | Musselburgh | | | |
| | | Nairn | | | |
| | | Neilston, n. Glasg. | | | |
| | | Newmills, near Kilmarnock | | | |
| • | | Newburgh, Fife | | | |
| | | Newton-on-Aye | | | |
| | | Newton Stewart | | | |
| | | North Berwick, n. Haddington | | | |
| | | North Queensferry | | | |
| | | Oban | | | |
| 800 | 25 | Peebles | | | |
| | | Perth | 25 0 0 | 4 16 0 | 22 10 0 |
| 5 | | „ new | 5 0 0 | | 1 17 6 |
| | | Peterhead | | | |
| | | Pittenweem | | | |
| | | Pollokshaws, near Glasgow | | | |
| | | Port Glasgow | | | |
| | | Portobello, n. Edin. | | | |
| | | Prestonpans | | | |
| | | Rutherglen, near Glasgow | | | |
| | | Renfrew, n. Paisley | | | |
| | | Saltcoats | | | |
| | | Sanquhar | | | |
| | | Selkirk | | | |
| | | South Queensferry | | | |
| | | St. Andrew's | | | |

| Number of Shares issued. | Amount per Share | Name of Company. | Amount paid up per Share | Dividend per Cent. per Ann. | Price. |
|---|---|---|---|---|---|
| | £ | | £ s. d | £ s. d | £ s. d |
| | | Stewarton | | | |
| | | Stirling | | | |
| | | Stonehaven | | | |
| | | Stonhouse, Lanrks. | | | |
| | | Stornoway | | | |
| | | Stranraer | | | |
| | | Strathaven, near Hamilton | | | |
| | | Thurso | | | |
| 800 | 1 | Tillicoultry, n. Alloa | | | |
| | | Tranent | 1 0 0 | | 1 0 0 |
| | | Troon | | | |
| | | Wick | | | |
| | | Wigton | | | |
| | | Wemyss | 4 10 0 | | |
| | | **IRELAND.** | | | |
| 300 | 10 | Armagh | 10 0 0 | 8 0 0 | 14 10 0 |
| | | Ballinasloe | | | |
| 700 | 50 | *Belfast* | 50 0 0 | | |
| | | Ballymena | | | |
| | | Ballymoney | | | |
| | | Carrickfergus | | | |
| | | Carlow, new | | | |
| | | Cork (see Un. Gen.) | | | |
| 1300 | 5 | Clonmel Consumrs | 5 0 0 | 5 0 0 | 5 0 0 |
| | | Drogheda | | | |
| 19,000 | 10 | *Dublin Consumers* | 5 0 0 | 7 0 0 | 6 0 0 |
| | | *Dublin Hibernian* (see United Gen.) | | | |
| 160 | 25 | Dundalk | 25 0 0 | | 22 0 0 |
| | | Dungannon | | | |
| 1000 | 5 | *Downpatrick* | 5 0 0 | | |
| | | Enniskillen | | | |
| | | Galway | | | |
| 400 | 10 | Kilkenny | 10 0 0 | 8 0 0 | 11 5 0 |
| | | Larne | | | |
| | | Limerick (see U.G.) | | | |
| 1725 | 5 | Limerick Consum. | 5 0 0 | 5 0 0 | 5 0 0 |
| 600 | 15 | Londonderry | 15 0 0 | 6 13 4 | 21 10 0 |
| 500 | 7 | Lisburn | 7 0 0 | 6 5 0 | 7 0 0 |
| 520 | 10 | Lurgan | 6 0 0 | 6 0 0 | 6 0 0 |
| | | Mallow | | | |
| | | Monaghan | | | |
| | | Nenagh | | | |
| 418 | 5 | Newtownards | 5 0 0 | 4 0 0 | 5 0 0 |
| | | New Ross | | | |
| | | Newry | | | |
| | | Omagh | | | |
| 125 | 20 | Portadown | 20 0 0 | 6 0 0 | 20 0 0 |
| 600 | 10 | Sligo | 10 0 0 | | |
| | | Tipperary | | | |
| | | Tralee | | | |
| | | Waterford | | | |
| | | Wexford | | | |

The Gas Works in the undermentioned towns belong to private individuals:—

| | | | | | |
|---|---|---|---|---|---|
| Abergavenny. | Ely. | Hertford. | Morpeth. | Sheerness. | Ware. (2 works) |
| Bridgenorth. | Farsley. | Holt. | Oswestry. | Sidmouth. | Wem. |
| Carlow, old. | Gainsborough. | Huntingdon. | Peterborough. | Sittingbourne. | Weymouth. |
| Carnarvon. | Goole. | Hyde (Cheshire) | Pontypool. | Spalding. | Whitchurch (Salop). |
| Deal. | Harleston. | Kingston-on-Thames. | St. Alban's. | Waltham Abbey. | Wisbeach. |
| Diss. | Hatfield. | Lynn. | Sandwich. | | |

The Gas Works belong to the Corporations, or to Commissioners acting under special acts of Parliament, in the following towns:—

| | | | | | |
|---|---|---|---|---|---|
| Carlisle. | Keighly. | Milton (Kent). | Rothesay. | Southport (Lanc.) | Walsall. |
| Cashel. | Knaresborough. | Paisley. | Richmond (Yorkshire). | Stockport | Wells (Norfolk). |
| Coleraine. | Lytham (Lanc.) | Rochdale. | Salford. | Strabane. | Youghall. |
| Greenock. | Manchester. | | | | |

# Price Current.

*The following List of Prices is corrected by an eminent wholesale house in each trade up to the latest period:—*

## CASTINGS, per Ton.

Average Weight of Cast Iron Pipes, per Yard.

| 1½ in. | 2 in. | 2½ in. | 3 in. | 4 in. | 5 in. | 6 in. | 7 in. | 8 in. | 9 in. | 10 in. | 12 in. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 21 | 28 | 33 | 51 | 70 | 89 | 107 | 126 | 149 | 177 | 208 lbs. |

| Retail Prices are 5 to 10 per cent. higher. | London. | Glasgow | Newcastle. | Wales. | Yorksh., Derbysh., and Staffdsh |
|---|---|---|---|---|---|
| | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| Pig Iron, No. 1 | 3 7 6 | 2 16 0 | 3 0 0 | 3 15 0 | 3 10 0 |
| 1½ and 2 inches Socket Pipes | 6 0 0 | 5 0 0 | 5 10 0 | 5 15 0 | 5 15 0 |
| 2½ and 3 do. do. | 5 17 6 | 4 17 6 | 5 7 6 | 5 12 6 | 5 12 6 |
| 4 and 5 do. do. | 5 15 0 | 4 15 0 | 5 5 0 | 5 10 0 | 5 10 0 |
| 6 inches and upwards do. | 5 12 6 | 4 15 0 | 5 2 6 | 5 7 6 | 5 7 6 |
| Extra for bends, branches, and connection | 2 0 0 | 2 0 0 | 2 0 0 | 2 0 0 | 2 0 0 |
| Retorts, 1st fusion | 5 5 0 | .. | .. | 4 17 6 | 5 0 0 |
| Do. 2nd fusion | 5 15 0 | 4 10 0 | 4 17 6 | 5 5 0 | 5 5 0 |
| Tank Plates, ⅜ thick and above | 5 10 0 | 4 17 6 | 5 0 0 | 5 7 6 | 5 17 6 |
| Do. less than ⅜ | 5 15 0 | 5 0 0 | 5 0 0 | .. | 5 10 0 |
| Plain Castings ex. models | 5 15 0 | 5 0 0 | 5 0 0 | 5 10 0 | 5 10 0 |

## COALS.

| NEWCASTLE. Unscreened. | s. | d. | |
|---|---|---|---|
| Burnhope | 5 | 3 | per ton. |
| Ravensworth Pelaw, Dean's Primrose | 5 | 9 | „ |
| Pelton, Brancepeth, Medomsley | 6 | 0 | „ |
| Pelaw | 6 | 3 | „ |
| Eighton Moor, Felling Main, New Pelton, Peareth, South Pelaw, Waldridge, Washington Hutton, South Peareth | 6 | 6 | „ |
| Ramsay's Cannel | 12 | 0 | „ |
| Cowen's Cannel | 12 | 0 | „ |

| DERBYSHIRE. Unscreened. | s. | d. | |
|---|---|---|---|
| Clay Cross, Deep Main, and New Birchwood | 6 | 6 | per ton. |

| SCOTCH CANNEL. | | | |
|---|---|---|---|
| Boghead | 23 | 0 | „ |
| Kirkness best | 23 | 0 | „ |
| Capeldrae, first quality | 20 | 0 | „ |
| Ditto, second quality | 10 | 0 | „ |
| Lothian | 18 | 0 | „ |
| Lesmahago at Glasgow | 16 | 6 | „ |
| Ditto at Leith | 18 | 0 | „ |
| Arniston | 16 | 0 | „ |
| Wemyss | 15 | 0 | „ |
| Donibristle | 10 | 6 | „ |
| Bridgeness, Kinneil | 11 | 0 | „ |
| Lochgelly, Lumphinan | 9 | 6 | „ |

## FIRE GOODS.

Best Bricks, 50s. per 1000, at Newcastle.
Do. Clay, 12s. per ton do.

## LEAD.

Soft pig, £18. 10s. per ton.

## WROUGHT IRON TUBING, subject to 40 per cent. Discount.

| | 2 inches. | 1½ inch. | 1¼ inch. | 1 inch. | ¾ inch. | ½ inch. |
|---|---|---|---|---|---|---|
| | s. d. | s. d. | s. d. | s. d. | s. d. | s. d. |
| Patent welded tubes, from 2 to 12 feet, per foot | 1 8 | 1 0 | 0 10 | 0 7 | 0 5 | 0 4½ |
| Ditto „ 6 in. to 18 in., each | 3 0 | 2 0 | 1 9 | 1 3 | 1 0 | 0 9 |
| Connecting pieces, or long screws | 3 6 | 2 3 | 2 0 | 1 6 | 1 2 | 0 11 |
| Bends, springs, and elbows, wrought iron | 3 9 | 2 3 | 1 9 | 1 0 | 0 10 | 0 8 |
| Tees, wrought or cast | 4 0 | 2 6 | 2 0 | 1 6 | 1 1 | 0 10 |
| Crosses, wrought or cast | 4 6 | 3 0 | 2 6 | 2 0 | 1 6 | 1 2 |
| Iron cocks | 17 6 | 9 6 | 7 6 | 4 6 | 3 3 | 2 6 |
| Ditto, with brass plug | 28 0 | 16 0 | 13 0 | 7 0 | 5 6 | 4 6 |
| Diminishing sockets, caps, plugs, and nipples | 1 3 | 0 9 | 0 8 | 0 6 | 0 5 | 0 4 |
| Plain sockets | 1 0 | 0 8 | 0 7 | 0 5 | 0 4 | 0 3 |
| Flanches | 1 9 | 1 6 | 1 3 | 1 0 | 0 9 | |
| Syphons, 2 quart | 15 0 | 14 0 | 13 6 | 13 0 | 12 0 | |
| Ditto 1 quart | 11 6 | 10 6 | 10 3 | 10 0 | 9 6 | |

## FREIGHTS, per Ton.

| *Coastwise—Newcastle.* | s. | d. |
|---|---|---|
| Chatham & Roches. | 6 | 6 |
| Cork | 8 | 3 |
| Dover | 7 | 0 |
| Dublin | 8 | 3 |
| Exeter Quay | 8 | 6 |
| Folkestone | 7 | 0 |
| Hastings | 7 | 6 |
| Ipswich | 6 | 3 |
| Jersey | 8 | 3 |
| London | 6 | 6 |
| Lowestoft | 4 | 6 |
| Lynn | 6 | 0 |
| Margate | 7 | 6 |
| Portsmouth | 7 | 6 |
| Plymouth | 7 | 3 |
| Southampton | 7 | 3 |
| Weymouth | 8 | 0 |
| Yarmouth | 5 | 0 |
| *Foreign.* | | |
| Amsterdam | 9 | 3 |
| Boulogne | 7 | 3 |
| Barcelona | 15 | 0 |
| Bordeaux | 9 | 6 |
| Calais | 7 | 3 |
| Dieppe | 8 | 0 |
| Hamburg | 9 | 0 |
| Havre | 8 | 9 |
| Lisbon | 10 | 0 |
| Rotterdam | 8 | 3 |
| Rouen | 11 | 0 |
| St. Petersburgh | 11 | 6 |
| Stettin | 8 | 0 |
| Trieste and Venice | 18 | 3 |